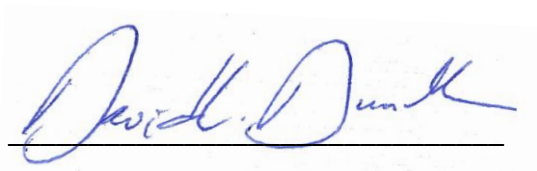


# EXHIBIT 4

**Opinions of David L. Duncklee, P.G.**

**regarding:**

- 1. How PFAS contaminants emitted to the air from the Fayetteville Works facility have and continue to migrate onto Plaintiffs' properties and into their groundwater, water supply wells, hot water heaters, surface water, and sediment, and**
- 2. The results of sampling and analytical testing of groundwater from residential water supply wells, surface water, sediment, and hot water heaters on Plaintiffs' properties showing significant levels of Fayetteville Works PFAS contamination.**



David L. Duncklee, P.G. (NC#1017)

July 24, 2023

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## 1.0 INTRODUCTION

### 1.1 Background and Focus

1. This report was developed for plaintiffs in the six initial “bellwether” cases in *Dew, et al. v. E.I. Du Pont de Nemours and Company, et al.* (5:18-cv-0073) and *O’Brien, et al. v. E.I. Du Pont de Nemours and Company, et al.* (5:20-CV-00208).

The six bellwether property owners and seven property addresses are shown in Table 1 below and Figure 1 on the following page:

**Table 1. Bellwether Plaintiff Properties.**

Owner Name	Address
Abril	4216 Marshwood Lake Road, Fayetteville, NC 28306
Branch	21 West Shaw Mill Road, St Pauls, NC 28384 37 West Shaw Mill Road, St Pauls, NC 28384
Davis	7242 Fire Department Road, Hope Mills, NC 28348
Faircloth	3884 Tranquility Road, Fayetteville, NC 28306
Pini	405 Jax Court, Fayetteville, NC 28312
Stevens	7619 Highway 87 South, Fayetteville, NC 28306

2. Since at least 1979 (Geosyntec June 2021, p. 4), E.I. du Pont de Nemours & Co. (“E.I. du Pont”) and Chemours (collectively “Defendants”) have operated Fayetteville Works (see Figure 1 below) and released approximately 166 tons or 330,000 pounds of per- and polyfluorinated alkyl substances (or “PFAS”) to the air which have deposited on the surrounding environment (Ruth Albright report, July 24, 2023, Table 2 and Figures 23-24). At least 44 years of releases to the air of the Fayetteville Works PFAS — a toxic group of man-made chemicals that includes HFPO DA (or “GenX”), PMPA, PEPA, PFMOAA, and many others, often referred to as “forever chemicals” — have contaminated hundreds of square miles of nearby properties in the Cape Fear River Watershed, including the seven bellwether properties listed above.



Figure 1. Site Aerial Map with Locations of Bellwether and Chemours Properties.

3. Ruth Albright's July 2023 report shows Defendants discharged PFAS from Fayetteville Works into the air which were transported by wind and settled onto the ground surface of properties in an air deposition area, which extends for hundreds of square miles from the source at Fayetteville Works.
4. Data from the North Carolina Department of Environmental Quality (NCDEQ) indicates emissions of Fayetteville Works PFAS continue to be deposited on off-site properties to the time of this report, in spite of the installation of control devices by Chemours.
5. Once the Fayetteville Works PFAS was deposited and settled onto these properties, the contaminants migrated through the sandy, silty, and clayey soil to the underlying and shallow groundwater aquifer system.
6. The water supply wells and the groundwater aquifers on the bellwether properties are all contaminated with PFAS emitted to the air from Fayetteville Works. In fact, Chemours' own testing shows the aquifer system below the surrounding region across hundreds of square miles around the Chemours facility is contaminated with Fayetteville Works PFAS.
7. Surface water and sediment on these properties are also contaminated with aerially emitted and deposited Fayetteville Works PFAS. Hot water heaters are contaminated with Fayetteville Works PFAS. It is likely that septic tanks at the residents have also been contaminated by PFAS compounds, along with surrounding soil and groundwater in the leach field.

## **1.2 Personal and C.V.**

8. The opinions expressed in this report are based upon my knowledge, skill, experience, training, and education. My opinions are also based upon my review of documents and other information that has been provided to me. I reserve the right to modify or supplement my opinions, as well as the bases for my opinions, as more information may become available. I have an hourly rate of \$280. A copy of my Curriculum Vitae and a list of testimony I have provided in the last 10 years is included in Appendix A.
9. I have 38 years of experience as a consultant in North Carolina working on environmental assessment and remediation projects. I have a Bachelor of Science degree in geology from North Carolina State University in Raleigh, North Carolina. I have been licensed as a geologist in North Carolina since 1989.



## 2.0 SUMMARY OF OPINIONS

### 2.1 Key Opinions

10. A summary of my key opinions is as follows:

- The PFAS compounds discussed in this report were produced at the Chemours facility and emitted to air.
- The air emissions of PFAS from Fayetteville Works over the past several decades have traveled with the wind and been (and still are) deposited onto soil at the ground surface on the bellwether properties.
- Once deposited onto the ground at the bellwether properties, the Fayetteville Works PFAS contaminants settle and migrate downward through the soil and mix into the groundwater aquifer, and then are pulled into water supply wells at the bellwether properties.
- Surface water, sediment, hot water heaters, soil, (and likely septic tanks, too) at the seven bellwether properties have also been impacted with Fayetteville Works PFAS contaminants.
- The most recent data collected by NCDEQ (up to early 2023) indicates PFAS contaminants from Fayetteville Works continue to be air deposited onto the ground surface and soil in the area of the bellwether properties.

### 2.2 Air Emission Data

11. Data presented in this report shows Fayetteville Works PFAS have been emitted as airborne contaminants into the air across hundreds of square miles in eastern North Carolina. These airborne PFAS contaminants have settled out and been deposited directly on the ground surface for decades on surrounding properties (including Plaintiffs' properties).

12. Many PFAS contaminants have been identified in the Fayetteville Works air emissions. The primary PFAS contaminants shown in the air emission data include:

HFPO-DA (GenX)	PEPA	PFMOAA	PFO2HxA	PMPPA
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13. Chemours's own studies have acknowledged and documented air emissions of PFAS contaminants from their Fayetteville Works facility that have been deposited on an area ranging from 70+ square miles (Geosyntec Corrective Action Plan (CAP), December 2019, p. xii and Table 4) to "potentially" 100 square miles (Geosyntec *On and Offsite Assessment*, October 2019, p. 55) around the facility.

14. The PFAS contaminants identified by Chemours as being emitted to air and deposited off-site are PMPA and other Table 3+ PFAS compounds (Geosyntec *Response to SA Report Comments*, June 2021, p. 15). Appendix B includes two tables (Table 3+ and Attachment C) that list the PFAS compounds directly attributed to operations at Fayetteville Works.

15. An air modeling study by USEPA staff using NCDEQ collected air monitoring data found that air emissions of Fayetteville Works PFAS compounds have migrated from the Chemours facility in multiple directions over several hundred surrounding square miles.

16. We collected data from NCDEQ for water supply well sampling in the region around the Fayetteville Works facility. Data was also obtained from NCDEQ for wet/dry deposition and rainfall data from several monitoring stations located around the Fayetteville Works facility.

- The water well data from NCDEQ indicates that PFAS contaminants from Fayetteville Works have contaminated water supply wells and the underground aquifer system over at least 500 square miles downwind of the facility.
- The air deposition data from NCDEQ indicates that PFAS contaminants continue to be deposited onto the area of the bellwether properties, which will recharge the amount of PFAS contaminant mass already in the aquifer, and continue to exacerbate the contaminated groundwater problem.

### **2.3 Our Data Showing PFAS Contamination on Bellwether Properties**

17. SynTerra collected samples of groundwater from bellwether property water supply wells for analytical laboratory testing of PFAS contaminants. Hot and cold tap water samples were also collected and tested, along with hot water heater water sediment and scale. In addition, surface water and sediment samples were collected and tested from selected bellwether properties.

18. The data in this report shows contamination of groundwater and drinking water wells on the bellwether properties by PFAS compounds emitted to the air by Fayetteville Works. PFAS contamination was also found by our testing in hot water heaters, surface water and sediment.

19. Our testing found the following Fayetteville Works PFAS, among others, in bellwether property site media:

**Table 2. PFAS Contaminants Detected by SynTerra Testing on Bellwether Plaintiff Properties.**

Water Supply Wells	Hot Water Heater Sediment	Hot / Cold Water Taps	Sediment	Surface Water	Soil
HFPO-DA (Gen X)	HFPO-DA (Gen X)	HFPO-DA (Gen X)	HFPO-DA (Gen X)	HFPO-DA (Gen X)	HFPO-DA (Gen X)
Hydro-Eve Acid	Hydrolyzed PSDA	PEPA	PMPA	PEPA	PFESA BP2
PEPA	PEPA	PFESA BP2		PFESA BP2	PFMOAA
PFESA BP2	PFESA BP1	PFMOAA		PFMOAA	PFO2HxA
PFMOAA	PFESA BP2	PFO2HxA		PFO2HxA	PFO3OA
PFO2HxA	PFPrA	PFO3OA		PMPA	PFO4DA
PFO3OA	PMPA	PFPrA		NVHOS	PFO45DA
PFPrA	PPF	PMPA			PPF
PMPA	NVHOS	PPF			R-PSDA
PPF		NVHOS			
NVHOS		R-Eve			
R-Eve		R-PSDA			
R-PSDA					

Prepared by: RP Checked by: DLD

## 2.4 Pathway Summary / Persistence

20. NCDEQ data indicates Fayetteville Works PFAS contaminants have been and still are being deposited onto surficial soil on downwind properties. These PFAS contaminants either wash horizontally overland to streams or ponds, or migrate downward through the soil to groundwater. Plaintiffs' properties are within the range where PFAS from Fayetteville Works have been and still are being deposited.

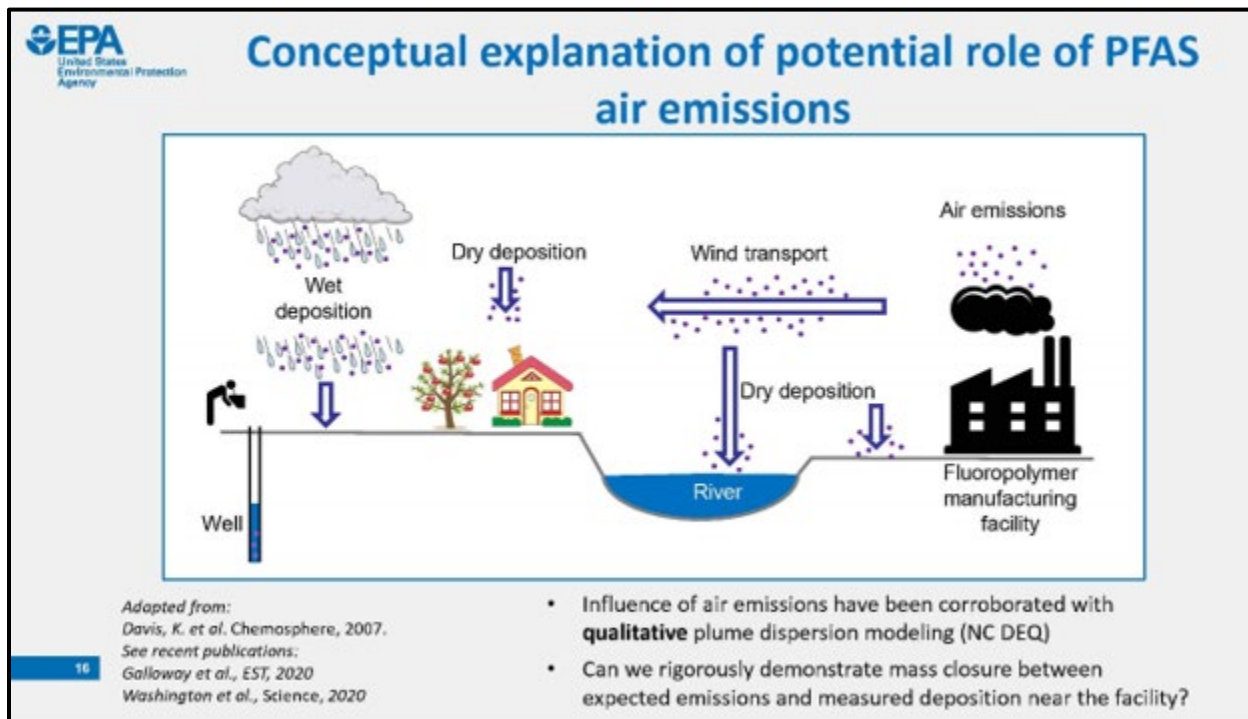


21. Based upon the results of soil borings by Chemours, the region is underlain by a complex system of interbedded sands, silts and clays that act as a reservoir, or aquifer system, for rainwater that has infiltrated downward through surficial soil. Their work shows there is not a single aquifer, but several. The work by Geosyntec for Chemours indicates the aquifer system consists of a perched aquifer (located on top of a clay zone), a Surficial Aquifer, the underlying Black Creek Aquifer, and then the Cape Fear Aquifer. The complexity of the aquifer materials will result in a time-consuming flow path for the PFAS contaminants to move through these aquifers.

### 3.0 PATHWAYS OF PFAS CONTAMINANTS TO BELLWETHER PROPERTIES

#### 3.1 How Fayetteville Works PFAS Emissions Get to Bellwether Properties

22. The USEPA figure below (Figure 2) illustrates the concept of how PFAS air emissions from a fluoropolymer manufacturing facility can migrate via wind transport and then deposit on the ground in wet or dry form to contaminate soil, surface water, and groundwater supply wells on off-site properties (USEPA Webinar, 2020).



**Figure 2. Conceptual Description of How PFAS Air Emissions Spread to Off-Site Properties (review the pathway from source at right to deposition area on left). (USEPA Webinar, 2020).**

### 3.2 Origin of PFAS Contaminants on Bellwether Properties

#### 3.2.1 Fayetteville Works Air Emissions

23. Ruth Albright's expert report states E.I. du Pont began manufacturing hundreds of polyfluorinated alkyl substances, or PFAS, in August 1979 at Fayetteville Works. Based on Ruth Albright's report and documents prepared by Chemours, this manufacturing activity included the production of, and air emission of, the following Fayetteville Works PFAS:

**Table 3: Partial List of Fayetteville Works Air Emitted PFAS.**

Acronym	Chemical Name	CAS #	Formula	Table 3+	Attachment C
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	C <sub>6</sub> HF <sub>11</sub> O <sub>3</sub>	√	√
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	C <sub>5</sub> HF <sub>9</sub> O <sub>3</sub>	√	√
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5	C <sub>3</sub> HF <sub>5</sub> O <sub>3</sub>	√	√
PFO2HxA	Perfluoro(3,5-dioxaheptanoic) acid	39492-88-1	C <sub>4</sub> HF <sub>7</sub> O <sub>4</sub>	√	√
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	C <sub>4</sub> HF <sub>7</sub> O <sub>3</sub>	√	√
PPF Acid	Perfluoropropionic acid	422-64-0	C <sub>3</sub> HF <sub>5</sub> O <sub>2</sub>	√	
PFMOPrA	Perfluoro 3-methoxypropanoic acid	377-73-1	C <sub>4</sub> HF <sub>7</sub> O <sub>3</sub>	√	√
PFMOBA	Perfluoro 3-methoxypropanoic acid	863090-89-5	C <sub>5</sub> HF <sub>9</sub> O <sub>3</sub>	√	√
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	C <sub>5</sub> HF <sub>9</sub> O <sub>4</sub>	√	
PFO3OA	Perfluoro(3,5,7-trioxaoctanoic) acid	39492-89-2	C <sub>5</sub> HF <sub>9</sub> O <sub>5</sub>	√	√
PFO4DA	Perfluoro(3,5,7,9-tetraoxadecanoic) acid	39492-90-5	C <sub>6</sub> HF <sub>11</sub> O <sub>6</sub>	√	√
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	C <sub>7</sub> HF <sub>13</sub> O <sub>7</sub>	√	√
Hydro-EVE Acid	Perfluoroethoxypropanoic acid	773804-62-9	C <sub>8</sub> H <sub>2</sub> F <sub>14</sub> O <sub>4</sub>	√	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	C <sub>8</sub> HF <sub>13</sub> O <sub>4</sub>	√	
R-EVE	R-EVE	EVS1428	C <sub>8</sub> H <sub>2</sub> F <sub>12</sub> O <sub>5</sub>	√	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	C <sub>4</sub> HF <sub>9</sub> O <sub>4</sub> S	√	
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	C <sub>4</sub> H <sub>2</sub> F <sub>8</sub> O <sub>4</sub> S	√	
PFESA-BP1	Nafion byproduct 1	29311-67-9 66796-30-3	C <sub>7</sub> HF <sub>13</sub> O <sub>5</sub> S	√	√
MMF	Difluoromalonic acid	1514-85-8	C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> O <sub>4</sub>	√	
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9	C <sub>4</sub> H <sub>4</sub> F <sub>4</sub> O <sub>3</sub>	√	
PFESA-BP2	Nafion byproduct 2	749836-20-2	C <sub>7</sub> H <sub>2</sub> F <sub>14</sub> O <sub>5</sub> S	√	√

Prepared by: RA Checked by: DLD

24. Testimony by a representative of DuPont, Dr. Shawn A. Gannon (Gannon, June 21, 2023, p. 274), stated he agreed DuPont knew in 1980 that the PFAS compound HFPO-DA (Gen X), and others, were being emitted to the air by Fayetteville Works operations.

### 3.2.2 No Other Sources in Area

25. I visited the bellwether properties and the surrounding area on several occasions, including two visits to the Chemours property, itself. Aside from the manufacturing operations on the Chemours property, there are no other significant potential sources of the PFAS air deposition fingerprint detected in Plaintiffs' groundwater. There is no other industrial facility in the relevant areas that would emit this pattern of PFAS contaminants, and I am not aware of any consumer products that, when used, would result in the type or pattern of PFAS contamination seen here.

26. Also, information from NCDEQ (Chemours Drinking Water Plan and Sampling Updates, July 26, 2022, slide 3) indicates HFPO-DA, or GenX, was "produced and emitted by one company in NC – Chemours (formerly DuPont)" and "has been discharged into the Cape Fear River for 30+ years."

27. In addition, recent deposition testimony by Mr. Sathya Yalvigi (Yalvigi, June 2023, pp. 167-178), a designated corporate representative of DuPont and Chemours, included statements that DuPont and Chemours know of no other source than Fayetteville Works for the following PFAS in Plaintiffs' water supply wells:

GenX (HFPO-DA)	Hydro-EVE acid	Hydrolyzed PSDA
MMF	MTP	Nafion BP 1 and 2
NVHOS	PEPA	PES
PFO <sub>2</sub> HxA	PFMOAA	PFECA B
PFECA-G	PFHpA	PFMOBA
PFMOPrA / PFMPA	PFO <sub>3</sub> OA	PFO <sub>4</sub> DA
PFO <sub>5</sub> DA	PMPA	PPF
R-EVE	R-PSDA	R-PSDCA

### 3.3 Data Showing PFAS Emissions to Air from Fayetteville Works

#### 3.3.1 Chemours Data

28. In their December 31, 2019, Corrective Action Plan (CAP) on behalf of Chemours, Geosyntec states the following:

- Section 3.3.1 (p. 18) – “The facility operates multiple permitted air discharge stacks, blowers and vents as part of manufacturing activities.” On page xii of the CAP Executive Summary, second paragraph, they state one of the three release routes of PFAS from the Site to the environment is “emissions to air.”
- Section 3.6.3 (p. 23) of the CAP concludes the Fayetteville Works PFAS mass emitted overall to the environment and Cape Fear River system includes “14% to 24% coming almost entirely from historical air process releases.”
- Executive Summary (p. xii) – “The PFAS that originate from the Site are referred to as Table 3+ PFAS.” Section 6.2.4 (p. 56) – “To date Table 3+ PFAS have been detected over an area of 70+ square miles (over 45,000 acres). The size of the area encompasses hundreds of private land parcels ...”. A listing of the Table 3+ PFAS compounds referred to here is provided in Appendix B.

29. In their On and Offsite Assessment Report on behalf of Chemours, version 2, dated October 31, 2019 (section 11, p. 55), Geosyntec states “Offsite, PFAS have been aerially deposited and exist as a distributed, diffuse source potentially present over an area of 100 square miles (radius of 6 miles) where concentrations in groundwater gradually become lower further away from the Site.” As shown later in this report, the actual extent of aerially deposited Fayetteville Works PFAS is at least 400-500 square miles.

30. In their Memorandum to NCDEQ (Geosyntec, June 14, 2021, p. 15), Geosyntec states “Table 3+ PFAS were historically emitted from the facility to the atmosphere, transported by wind and then aerially deposited. These Table 3+ PFAS have since infiltrated into offsite groundwater.”

### 3.3.2 NCDEQ Conclusions and Consent Order Requirements

31. The Consent Order entered into by NCDEQ, Chemours, and others agreed to test water supply wells for certain of the PFAS contaminants discharged to air by Chemours manufacturing operations (see Attachment C of that document included in Appendix B). Table 3 above (paragraph 23) lists certain Attachment C compounds emitted to the air by Fayetteville Works).

### 3.3.3 Ruth Albright Report

32. Based on Ruth Albright's report, Table 3 (see paragraph 23, p. 8) above lists the PFAS originating and historically emitted to the air and surrounding environment from Fayetteville Works.

33. Ruth Albright's report includes air dispersion modeling results which show Chemours discharged Fayetteville Works PFAS contaminants into the air that deposited in dry form or wet (in rainfall) across hundreds of square miles. The extent of these contaminants discharged on the surrounding properties and environment is shown in Figure 3 below. From her expert report, Figure 3 below shows the extent of GenX air deposition across at least a four-county area. Ruth Albright's report also includes a discussion of air pollution control equipment over time.



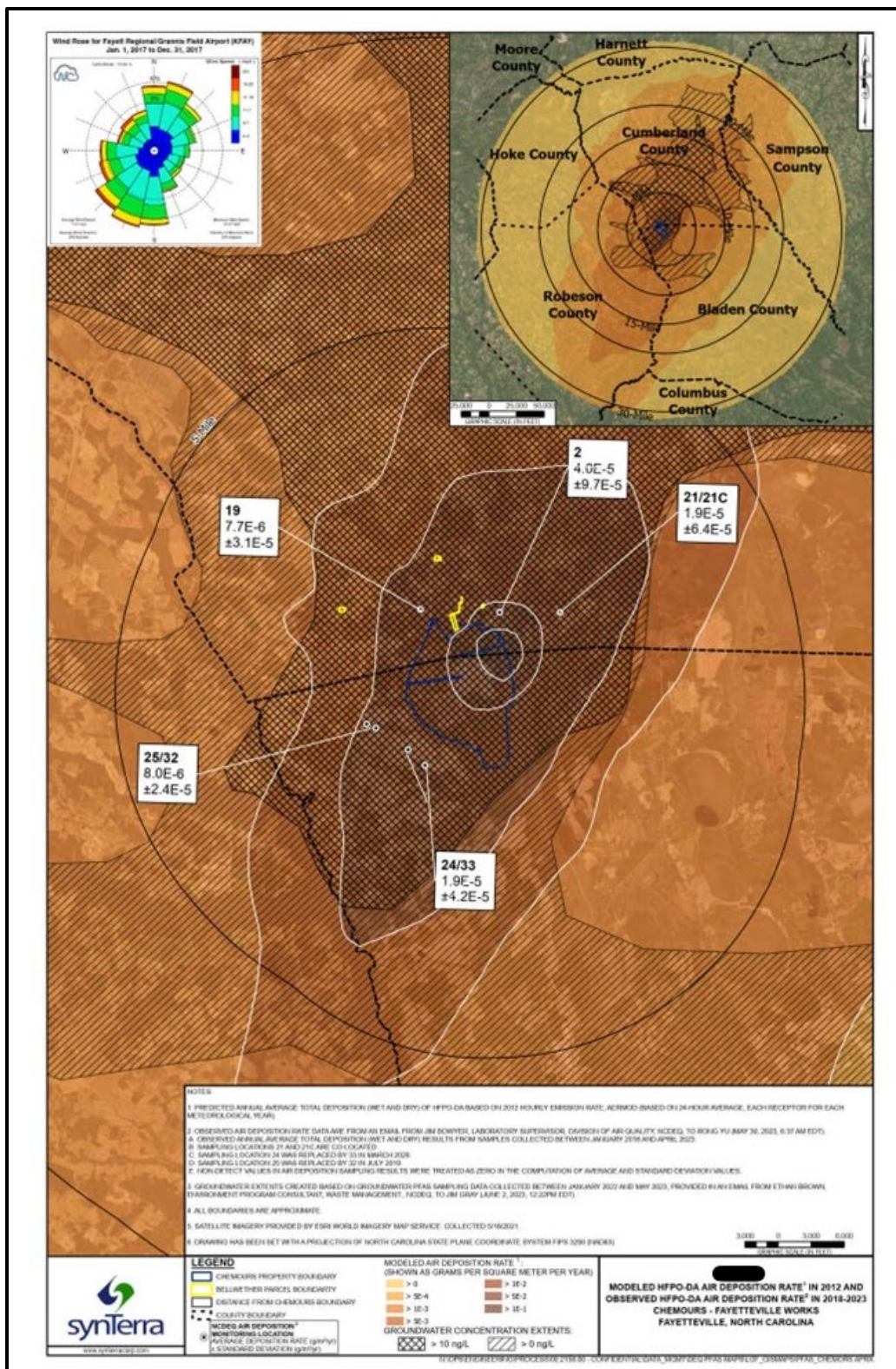
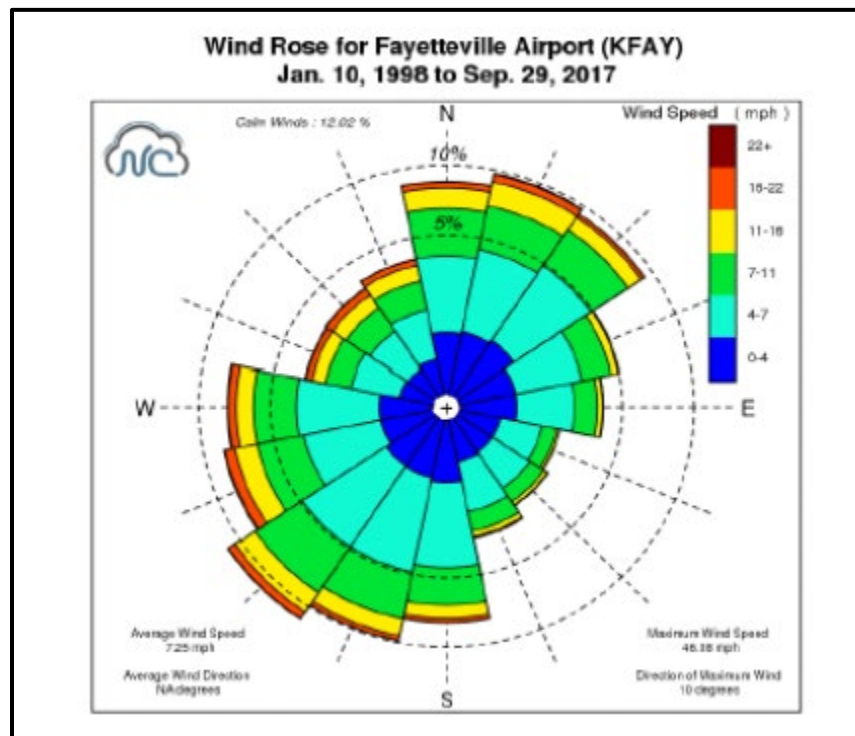


Figure 3. Modeled HFPO-DA (GenX) Air Deposition Area (Albright, 2023 July 24, Figure 23). (Figure number redacted for clarity)

### 3.4 Wind Transport Directions

34. Wind directions for the nearby Fayetteville Airport are shown in the wind rose below, generated by NCDEQ (see link below). The wind transport directions in this area are predominantly, but not exclusively, along a southwest to northeast direction.

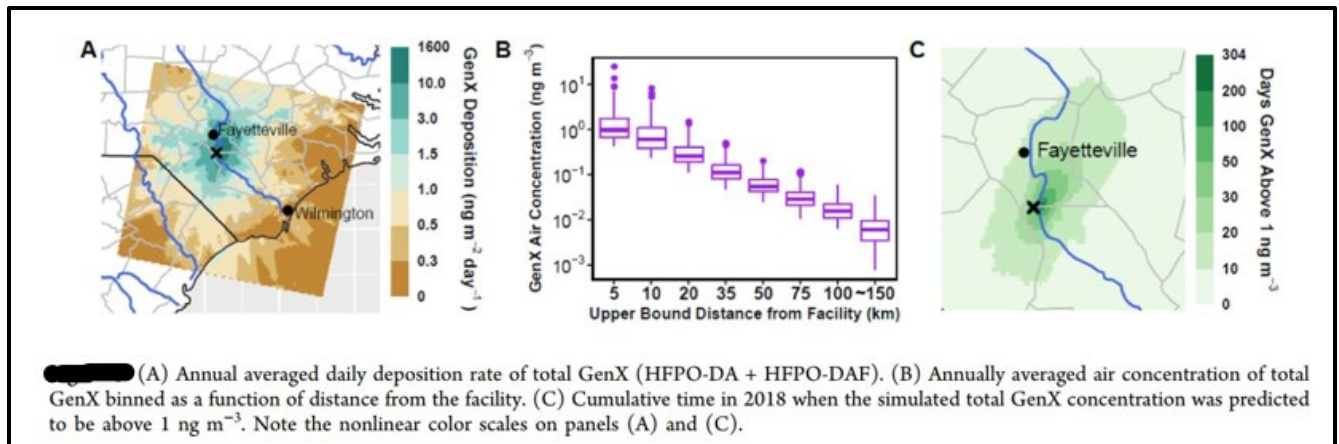


**Figure 4. Fayetteville Area Wind Rose.**

Source: ([https://files.nc.gov/ncdeq/GenX/consentorder/paragraph12/Wind\\_Rose.pdf](https://files.nc.gov/ncdeq/GenX/consentorder/paragraph12/Wind_Rose.pdf) )

### 3.5 Deposition to the Ground - USEPA Staff Publication

35. Modeling of Fayetteville Works PFAS air emissions by USEPA staff, using NCDEQ air sampling data from 2018, shows PFAS, including HFPO-DA (GenX), were being emitted to the air over 90 miles (~150 kilometers) from the Chemours facility (see figure below). The peer reviewed paper by D'Ambro and others stated "The new model, CMAQ-PFAS, predicts that 5% by mass of total emitted PFAS and 2.5% of total GenX are deposited within ~150 km [90 miles] of the facility, with the remainder transported out" (D'Ambro, USEPA, 2021).



**Figure 5. D'Ambro Publication Showing Modeling Results of GenX Deposition to Ground Surface from Chemours' Air Emissions in 2018 (Figure number redacted for clarity)**

36. From Figure 5 of the D'Ambro paper shown above, panel A shows the annual averaged daily deposition rate of total GenX from the Chemours facility to the ground surface (see greenish colored area for highest ground deposition rates).

37. Panel B above provides a graph of GenX air concentrations with distance from Chemours.

38. Panel C shows cumulative modeled total GenX concentrations in the air emitted across at least six counties in all directions from the Chemours facility, but especially to the northeast.

### 3.6 How PFAS Infiltrates Into the Ground and Groundwater Aquifers

#### 3.6.1 Rainfall

39. The National Weather Service Forecast Office for Raleigh climate records show an average precipitation of 44.46 inches per year for the Fayetteville area based on observed weather from 1981 to 2010. (<https://www.weather.gov/rah>, Climate and Past Weather).

40. Therefore, there is ample rainfall to wash aerally deposited Fayetteville Works PFAS overland into streams and ponds.



41. Approximately 10 inches/year of rainfall (approximately 20-25% of total annual rainfall) infiltrates the ground surface and recharges underlying aquifers. This infiltrating rainfall carries the air deposited PFAS contaminants through soil downward to the shallow aquifers beneath the bellwether properties (NCDENR, 2003 and USGS, 2005).

### **3.6.2 Infiltration of Rainfall through Soil to Groundwater Aquifers**

42. The Geosyntec CAP states (section 3.6.1, p. 22) "Emissions to air were deposited on surface soils onsite and offsite and have over time infiltrated to groundwater, and in some cases, migrated in groundwater to surface water receptors including the Cape Fear River, Willis Creek, and Georgia Branch Creek."

43. Figure 1 in the Geosyntec CAP (p. 17) shows conceptually how aerially transported PFAS moves downwind, is deposited on the ground surface, impacts surface water bodies, and also infiltrates to underlying aquifers and into groundwater supply wells. Note the Geosyntec figure and USEPA figure presented above in paragraph 22 show the same transport concepts that explain how the bellwether properties and groundwater have been contaminated.

44. Again, from the On and Offsite Assessment Report, dated October 31, 2019 (section 10.2, p. 50), Geosyntec states "With the data collected to date, PMPA appears to be the Table 3+ PFAS most representative of air emissions; it is the highest concentration PFAS in offsite groundwater samples. The presence of offsite Table 3+ PFAS in groundwater originate from emissions to air followed by association with particulates in air and then subsequent aerial deposition leading to infiltration through the unsaturated zone with rainfall and ending up in groundwater." The concentrations at the Site then decrease radially away from the facility source area "in all directions, consistent with air deposition patterns." It should be noted that they did not analyze PPF, which has been found at elevated concentrations at all bellwether properties.

45. Based on data collected from the property owners, well tags, and the use of a downhole camera, the depths of the bellwether property groundwater supply wells vary from as shallow as 20 feet of depth to 83 feet of depth below ground surface (see table below).

Table 4. Bellwether Properties Water Supply Well Information

	ABRIL PROPERTY	BRANCH PROPERTY	DAVIS PROPERTY	FAIRCLOTH PROPERTY	PINI PROPERTY	STEVENS PROPERTY		
Water Supply Well ID						WSW-1	WSW-2	WSW-3
Property Address	4216 Marshwood Lake Road, Fayetteville, NC	21 West Shaw Mill Road, St Pauls, NC	7242 Fire Department Road, Hope Mills, NC	3884 Tranquility Road, Fayetteville, NC	405 Jax Court, Fayetteville, NC	7619 NC-87, Fayetteville, NC		
Water Supply Well Information Source	Water Supply Well Tag <sup>f</sup>	No water supply well tag <sup>e</sup> . Downhole camera used <sup>f</sup> .	Water Supply Well Tag <sup>f</sup>	No water supply well tag <sup>f</sup> . Downhole camera used <sup>f</sup> .	Water Supply Well Tag <sup>f</sup>	No water supply well tag <sup>f</sup> . Downhole camera used <sup>f</sup> .	Verbal information from property owner <sup>f</sup> .	Verbal information from property owner <sup>f</sup>
						Verbal information from property owner <sup>f</sup> .		Water supply well clogged with sediment <sup>f</sup> .
Date Installed	7/10/2006	NA <sup>a</sup>	2/2/2005	NA <sup>a</sup>	3/22/2020	NA <sup>a</sup>	1992	NA <sup>a</sup>
Depth (ft <sup>b</sup> )	78	30	28	83	30	36	48	
Casing Depth (ft <sup>b</sup> )	78	NA <sup>a</sup>	24	NA <sup>a</sup>	NL <sup>d</sup>	NA <sup>a</sup>	NA <sup>a</sup>	
Casing Diameter (in <sup>c</sup> )	4	2	2	2	4	1.25		
Screen Interval (ft <sup>b</sup> )	60 - 75	20-30	25 - 28	78-83	20 - 26	33-36		
Gravel Interval (ft <sup>b</sup> )	58-71	NA <sup>a</sup>	NL <sup>d</sup>	NA <sup>a</sup>	20 - 35	NA <sup>a</sup>		
Static Water Level (ft <sup>b</sup> )	31	10.32	NL <sup>d</sup>	46.31	15	13		
Static Water Level Date	NL <sup>d</sup>	NA <sup>a</sup>	3/1/2005	NA <sup>a</sup>	5/22/2020	NA <sup>a</sup>		
Yield (GPM <sup>g</sup> )	20		25		15			
Specific Capacity (GPM/FT.dd <sup>h</sup> )	20		NL <sup>d</sup>		NL <sup>d</sup>			

Created by: RB Checked by: DD**Notes:**<sup>a</sup>: Not Available (NA) to review by SynTerra<sup>b</sup>: Feet (ft)<sup>c</sup>: Inches (in)<sup>d</sup>: Not Listed (NL) on Water Supply Well Tag for review by SynTerra<sup>e</sup>: SynTerra onsite in January 2023<sup>f</sup>: SynTerra onsite in March 2023

WSW-1: Water Supply Well 1

WSW-2: Water Supply Well 2

WSW-3: Water Supply Well 3

<sup>g</sup>: Gallons Per Minute (GPM)<sup>h</sup>: GPM/Feet(ft). Drawdown (dd)

### 3.6.3 NCDEQ and Chemours Data Showing Where Fayetteville Works PFAS have Infiltrated into Downwind Properties and Aquifers

46. As shown in the NCDEQ figure below, Chemours' Fayetteville Works PFAS air emissions have impacted groundwater across four North Carolina counties and hundreds of properties around the Chemours plant (NCDEQ Slideshow, Chemours Drinking Water Plan and Sampling Updates, July 26, 2022, slide 12).

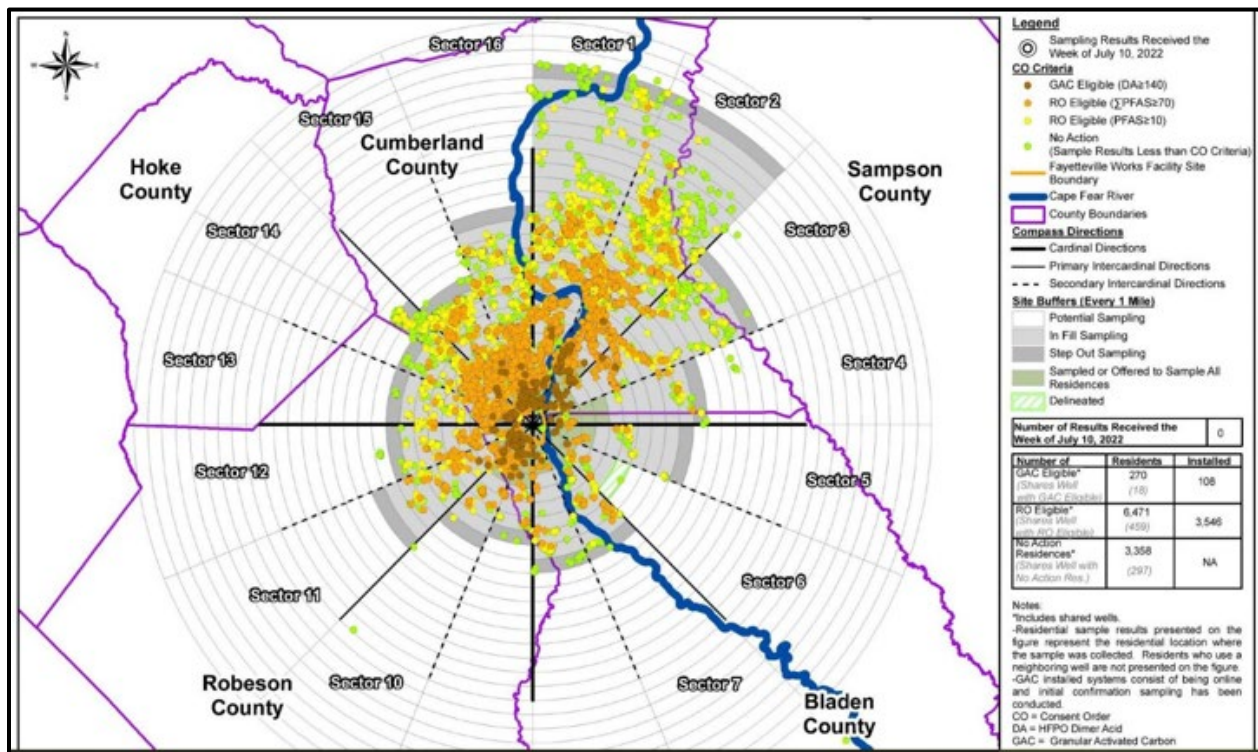


Figure 6. NCDEQ Presentation July 26, 2022, Showing Downwind Water Supply Wells Across Four Counties Contaminated by Fayetteville Works PFAS. Slide 12. Data up to July 10, 2022.

### 3.7 Current Size of Fayetteville Works PFAS Groundwater Plumes Across Multi-County Area

47. Using the most current data provided by NCDEQ (NCDEQ, Ethan Brown, 2023) from the Chemours water supply well sampling program (required by the Consent Order), Figure 7 below has been generated to show the generalized groundwater impacts from HFPO-DA, or GenX, in the area around Fayetteville Works.



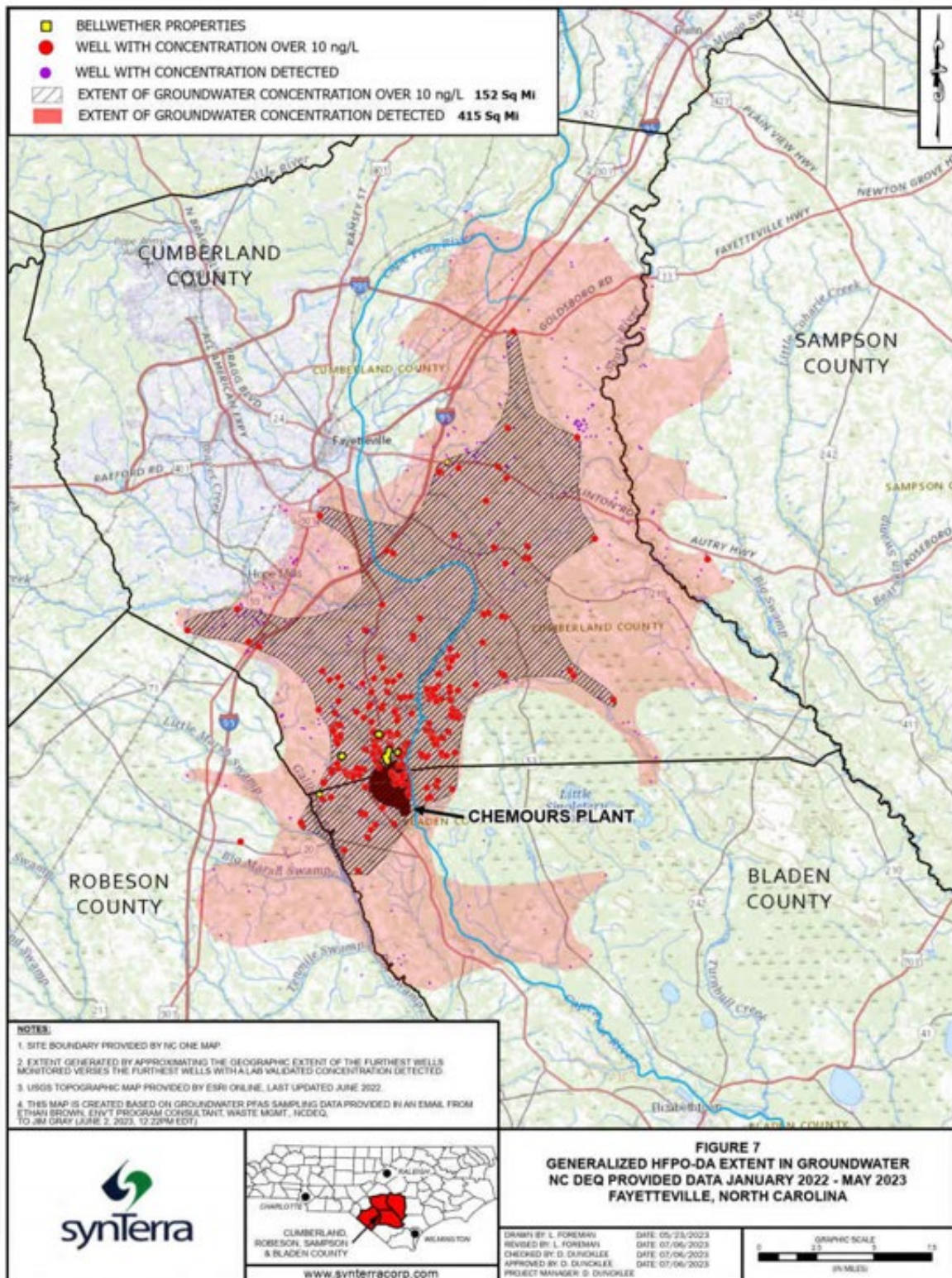


Figure 7. Extent of HFPO-DA (GenX) Contamination in Groundwater from Fayetteville Works Air Emissions (NCDEQ, 2022-2023).

48. The figure above (Figure 7) illustrates the aerial extent of groundwater contaminated with HFPO-DA (GenX) above the final Drinking Water Health Advisory level of 10 ng/L (parts per trillion, USEPA, June 15, 2022 Federal Register) has reached over 150 square miles in size. This plume is in line with the documented wind direction data, from northeast to southwest of the Fayetteville Works facility.

49. Figure 7 above also shows the aerial extent of groundwater contaminated with GenX, “produced and emitted by one company in NC – Chemours (formerly DuPont)” (NCDEQ, July 26, 2022) above laboratory detection levels is currently over 400 square miles in the four-county area.

50. Similar to the GenX map above (Figure 7), but now for PMPA, Figure 8 below shows this PFAS contaminant from Fayetteville Works emissions has reached a length of approximately 35-miles across over 500 square miles above 10 ng/L (parts per trillion, threshold from the Consent Order) and approximately 575 square miles at detectable levels.



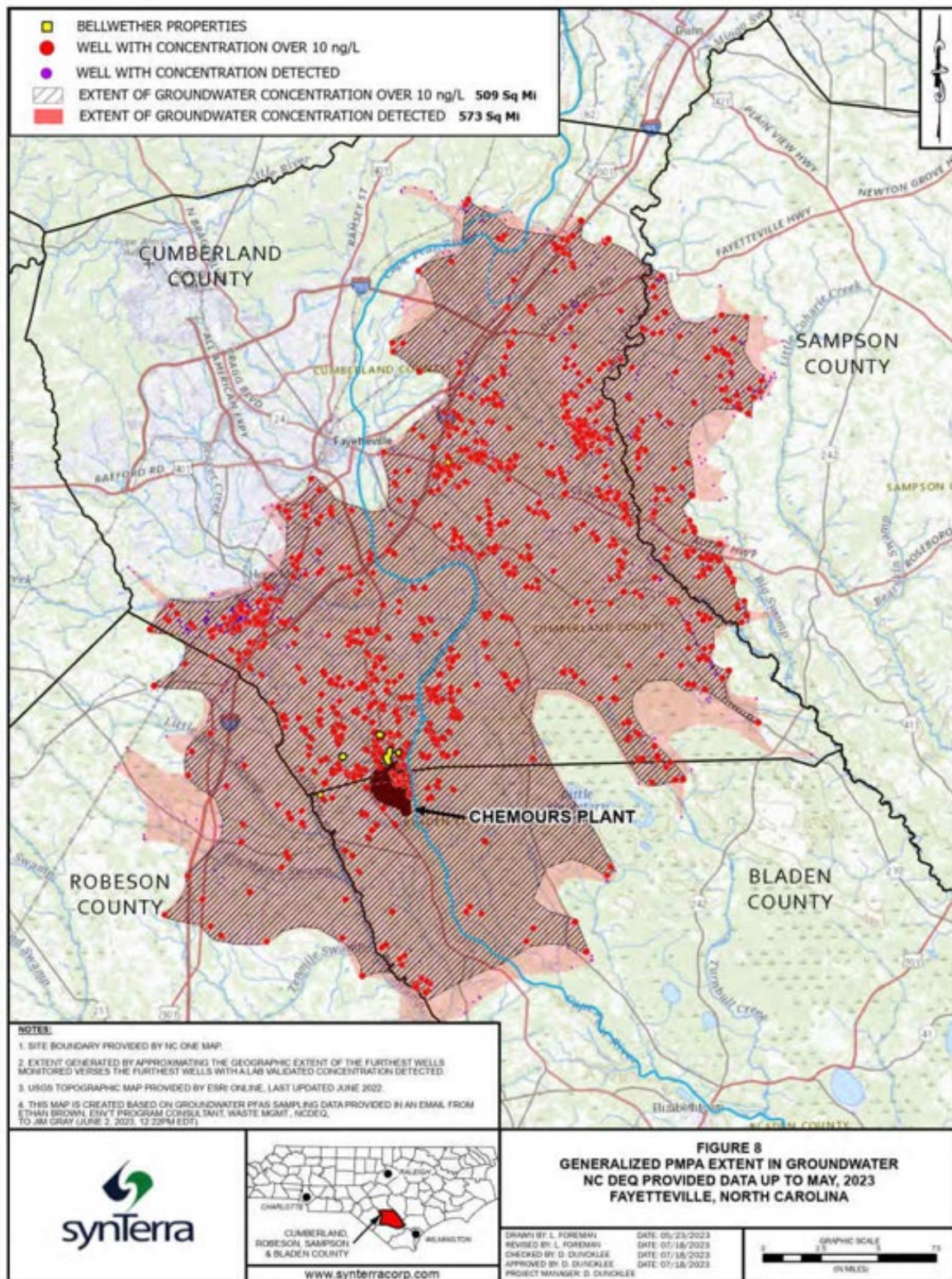


Figure 8. Extent of PMPA Groundwater Contamination from Fayetteville Works Air Emissions (NCDEQ, 2022-2023).

51. There is evidence groundwater impacts from Chemours' operations extend into deep aquifer systems. For example, per NCDEQ records, a residential supply well located at 3501 Cedar Hill Drive, located approximately 8 miles northeast of the Fayetteville Works, which is screened in an aquifer 252 to 362 feet below ground surface, was tested and contained Fayetteville Works PFAS compounds in 2019 (Carey-CHEM-02946929).

#### **4.0 BELLWETHER PROPERTY TESTING RESULTS AND DATA**

52. Synterra collected samples from the bellwether properties and had them analyzed for Fayetteville Works PFAS. Samples were collected and analyzed by an independent laboratory from water supply wells, surface water and sediment, hot- and cold-water taps, and hot water heaters.

53. The results of this testing, first presented in paragraph 19 above, are discussed below beginning with section 4.1. Further documentation of these and other testing results can be found as follows:

- The analytical laboratory reports for samples collected by SynTerra are included in Appendix C.
- Appendix D includes tables summarizing the testing results of bellwether property samples of water supply wells, hot and cold-water taps, sediment, and surface water.
- Appendix E includes tables for hot water heater sediment testing results.
- Maps of each of the seven bellwether properties, showing sampling locations, are included in Appendix F, and
- Tables presenting historical water supply well testing results performed by others on the bellwether properties and the Sessoms property at 4024 Marshwood Lake Road, are included in Appendix G.

#### **4.1 Water Supply Well Test Results**

54. Synterra collected groundwater samples from the water supply wells of the Bellwether properties between January and March 2023. Maps showing the individual bellwether properties, the water well locations, and other information are presented in Appendix F-1 to F-6.

55. The samples were analyzed by an independent laboratory (see Appendix C for the laboratory reports) for PFAS contaminants known to be in air emissions from Fayetteville Works (see list of Fayetteville Works air emitted PFAS in Table 3 above, paragraph 23).

56. As shown in the tables in Appendix D, the following Fayetteville Works emitted PFAS contaminants were found in a water supply well on all seven of the bellwether properties:

PEPA	PFMOAA	PMMA	PPF
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57. Fayetteville Works PFAS detected by our testing of bellwether property water supply wells also included the following findings (see tables in Appendix D-1 to D-7):

- HFPO-DA (GenX) in well water from six of the seven properties (all but Pini)
- PFO2HxA in well water from six of the seven properties (all but Branch 37 West Shaw Mill Road)
- NVHOS in the Abril, Branch (21 West Shaw Mill Road), Davis, Faircloth and Pini well samples,
- PFESA BP2, or Nafion Byproduct 2, was present in the Branch (21 West Shaw Mill Road), Davis and Stevens ground water sample results,
- PFO3OA was present in the Branch (21 West Shaw Road) and Stevens groundwater sample results,
- R-Eve was present in the Branch (21 West Shaw Road), Faircloth, and Stevens groundwater sample results,
- R-PSDA was present in the Faircloth and Stevens groundwater sample results, and
- Hydro-Eve acid was present in the Stevens groundwater sample results.

#### 4.2 Surface Water and Sediment Testing

58. Surface water samples collected from Marshwood Lake, adjacent to the Abril property (see Appendix F-1 map), and from Willis Creek, adjacent to the Faircloth property (see Appendix F-4 map), between January and March 2023 by SynTerra were



analyzed and found to contain these Fayetteville Works PFAS (see tables in Appendix D-1 and D-5):

HFPO-DA (GenX)      PEPA      PFMOAA      PFO2HxA      PMPA      PPF

59. Additional Fayetteville Works PFAS compounds identified from the SynTerra sampling events in surface water indicate:

- NVHOS, PFESA BP2, PFHpA, PFO3OA, and R-EVE were present in Marshwood Lake surface water samples (see table in Appendix D-1).

60. Analyses of sediment samples (see table in Appendix D-1) collected from Marshwood Lake, adjacent to the Abril property, and Willis Creek, adjacent to the Faircloth property (see table in Appendix D-5), both were found to contain concentrations of HFPO (GenX). Sediment samples collected from Marshwood Lake also contained concentrations of PMPA and PPF.

#### 4.3 Hot and Cold Tap Water Testing

61. Hot and cold-water samples collected by SynTerra between January and March 2023 from the kitchen faucets of the Bellwether properties were analyzed for the presence of Fayetteville Works PFAS (see tables in Appendix D). With the exception of the Pini tap water samples (which contained only PMPA and PPF), and Branch 37 West Shaw Mill Road, which was not sampled, all bellwether tap water samples contained the following Fayetteville Works PFAS:

HFPO-DA (GenX)      PEPA      PFMOAA      PFO2HxA      PMPA      PPF

62. Additional Fayetteville Works PFAS compounds identified from the SynTerra sampling and analytical testing (see tables in Appendix D) of hot and cold-water taps at the bellwether properties indicate:

- NVHOS was present in the Abril, Branch, Davis, and Faircloth tap water samples,
- PFESA BP2 (Nafion byproduct 2) was present in the Abril, Branch, Davis, and Stevens samples,
- PFO3OA was present in Abril and Stevens tap water, and
- R-Eve and R-PSDA were present in Davis, Faircloth and Stevens tap water.

#### 4.4 Hot Water Heater Sediment

63. SynTerra collected sediment samples from the hot water heaters of the following Bellwether properties on March 27, 2023 (Branch 21 West Mill Road and Stevens), and May 1, 2023 (Abril, Davis, Faircloth, Pini, and Stevens) and submitted them for laboratory analysis of Fayetteville Works PFAS. The results of analytical testing are included in the tables in Appendix E, and are summarized as follows:

- The Stevens hot water heater contained HFPO (GenX), PMPA, PFO2HxA, PFMOAA, and PPF.
- The Abril and Davis heater sediment contained PMPA and PPF
- The Branch property water heater contained PPF
- The hot water heater sediment samples collected from the Branch and Faircloth properties contained PPF.

64. Sediment and scale samples from the inside of a hot water heater from the Sessoms property were collected by SynTerra on April 19, 2023. The samples were tested by an independent laboratory for PFAS contaminants associated with Fayetteville Works. The results of the analytical testing are included in table Appendix E-7, and are summarized as follows:

- HFPO-DA (GenX), PEPA, PMPA, PFESA BP1 (Nafion byproduct 1), PFPrA, and PPF were found in both the sediment and scale samples.
- Additional Fayetteville Works PFAS found in the heater scale sample included Hydrolyzed PSDA, NVHOS, and PFESA BP2 (Nafion byproduct 2).

#### 4.5 Soil

65. Surficial soil sampling and analytical testing results by TRC Companies, Inc. have been reviewed and included in Appendix H. Maps showing the sampling locations on all six bellwether properties and a copy of the laboratory analytical report are also included in this Appendix. Their findings are summarized as follows:

- HFPO-DA (GenX), PFO2HxA, PFMOAA, PMPA, PFESA BP2, PFO3OA, PFO4DA, PFO5DA, PPF, R-Eve, and R-PSDA were all detected in Abril property soil.
- Soil at the Davis and Faircloth properties was impacted with PFO2HxA, PMPA, PFO3OA, PFO4DA, and PFO5DA. The Faircloth property was also found to contain PFESA BP2.
- The Branch (21 West Mill Road), Pini, and Stevens properties all contained PFO2HxA and PMPA. The Pini property also contained PFO3OA.

#### 4.6 Septic Tanks and Reverse Osmosis Unit Discharges to Groundwater

66. All of the Bellwether Plaintiffs' properties use septic systems. The use of untreated well water at the Plaintiff's property, which has been documented to contain Fayetteville Works PFAS, will result in PFAS contaminated household wastewater discharging into their septic tank. Septic tanks are not designed for PFAS treatment and do not remove nor degrade PFAS compounds. It is likely that PFAS contaminants being discharged into a typical septic system will pass through to underlying soil and/or shallow groundwater aquifer. This means that all untreated water used at Plaintiffs' property has resulted, and will result, in PFAS reentering the groundwater at Plaintiffs' properties.

67. Furthermore, for those plaintiffs using Chemours-provided reverse osmosis systems (Pini and Branch 21 West Mill Road), these systems generate PFAS containing wastewater typically discharged to the ground surface which will also eventually result in PFAS reentering the soil and underlying groundwater at Plaintiffs' properties.

#### 4.7 Data Validation

68. SynTerra contracted with an external data validator to review the procedures, methods, and findings in the analytical laboratory reports. Environmental Standards, Inc. (Environmental Standards) conducted a quality assurance (QA) review of the laboratory analyses for samples collected by SynTerra (analytical reports in Appendix C). Their report is included in Appendix I. The samples included in the QA review are presented on Table 1 of their report. The data validation review was performed by evaluating the summary forms, raw data, and other miscellaneous information provided in the laboratory data packages. Environmental Standards performed calculation checks of sample and quality control (QC) results and performed a critical qualitative evaluation of the reported positive results. The reported analytical results are presented in Section 2 of the report in Appendix I. Data was examined to determine the usability of the analytical results and compliance relative to the analytical requirements specified in U.S. Department of Defense Guidelines. Qualifier codes are placed next to the results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. Details of this QA review are presented in Section 1 of the report.

69. The conclusions of the QA review indicated several PFAS results were qualified due to holding time exceedances, method blank contamination, low labeled pre-extraction internal standard recoveries, calibration issues, out-of-criteria initial and continuing calibration verification standard recoveries, field duplicate imprecision, and other factors. However, based on the conclusions of the QA review, the data within the sample set is usable within the limitations of the flagged results. Their data validation findings are common based on our experience, and the data can be used within the limitations noted.

70. Sample holding times were exceeded slightly for the hot water heater sediment samples collected on May 1, 2023 and analyzed for PFAS. These results are denoted with an 'H' flag in the reports and in our tables. Given that PFAS compounds do not readily degrade, and that hold times have been exceeded for samples collected by and used by Chemours' contactors, as well, this data can also be used within the limitations noted.

#### 4.8 Piezometer Installation and Aquifer Water Level Measurements

71. SynTerra installed three groundwater piezometers on the properties shown below to determine water levels in the aquifers next to these three water supply wells. The table below shows the pertinent information on their construction and two sets of water levels. The piezometers were installed adjacent to the water supply wells.

**Table 5. Piezometer Data for Select Bellwether Properties**

	ABRIL PROPERTY		DAVIS PROPERTY		PINI PROPERTY	
Date Installed	3/30/2023		3/30/2023		3/30/2023	
GPS	34.860757°N, -78.833898°W		34.858843°N, -78.876491°W		35.042684°N, 78.791262°W	
Depth (ft)	56.5		20		20	
Casing Diameter (in)	1, PVC		1, PVC		1, PVC	
Screen Interval (ft)	51.6-56.6		10-20 ft		10-20 ft	
Static Water Level (ft)	3/31/2023	35.26	3/31/2023	15.72	3/31/2023	15.03
	4/3/2023	35.20	4/2/2023	15.44	4/3/2023	15.60

Created by: RBP Checked by: DLD

#### 5.0 WHY PFAS CONTAMINATION WILL PERSIST ON BELLWETHER PROPERTIES

72. As shown in further detail below, PFAS contaminants emitted from Fayetteville Works and deposited into soil and groundwater on the bellwether properties will persist because:

- Contaminants continue to be deposited by air emissions from Fayetteville Works
- Chemours' consent order with NCDEQ does not require active cleanup or remediation of the bellwether properties, and
- PFAS contaminants will likely move through the complex aquifer system at significantly different rates.

**For additional information on this subject, see the Expert Report of David Genereux.**

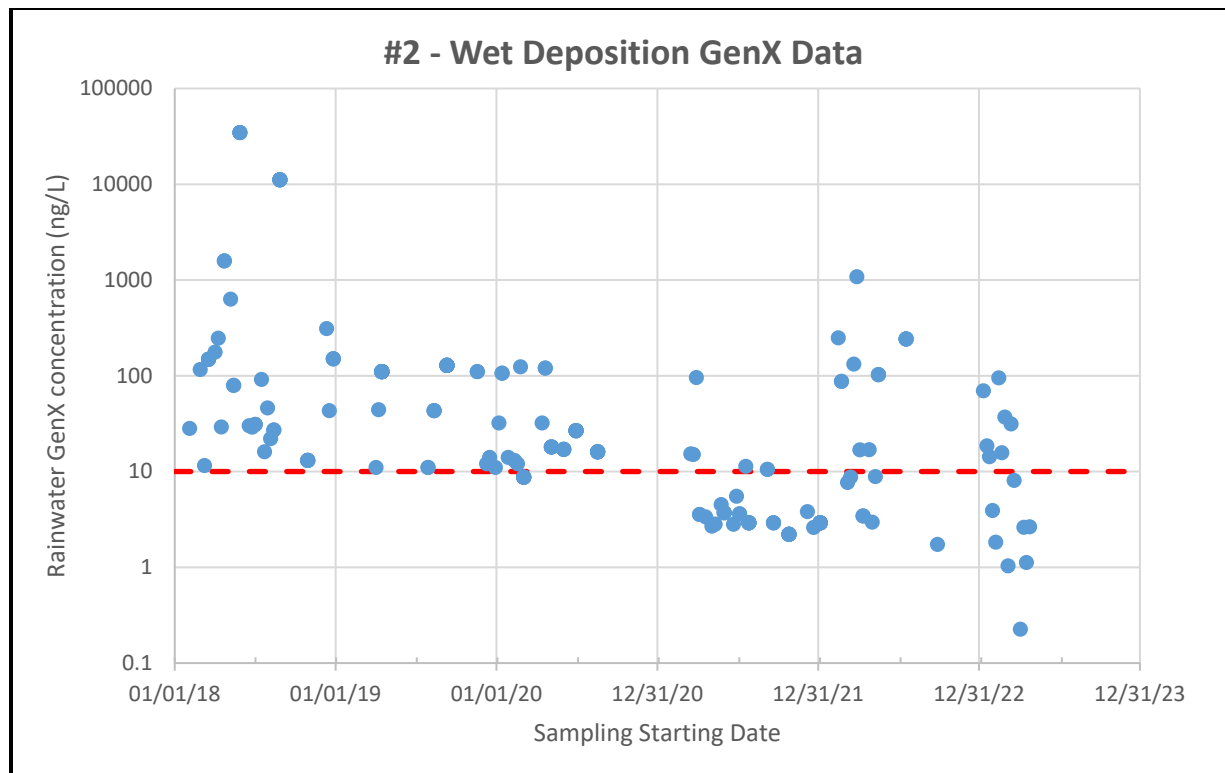
### **5.1 Air Deposition Continues Despite Chemours Control Systems**

73. Chemours' primary air control device, the thermal oxidizer, mandated by the terms of the Consent Order, and other controls, became operational by January 1, 2020.

74. However, based on rainwater data collected by NCDEQ since 2018 in the area of the bellwether properties, rainwater continues to contain HFPO-DA (GenX) at levels above the federal drinking water health advisory level of 10 ng/L (parts per trillion) even after the installation of the thermal oxidizer three and a half years ago.

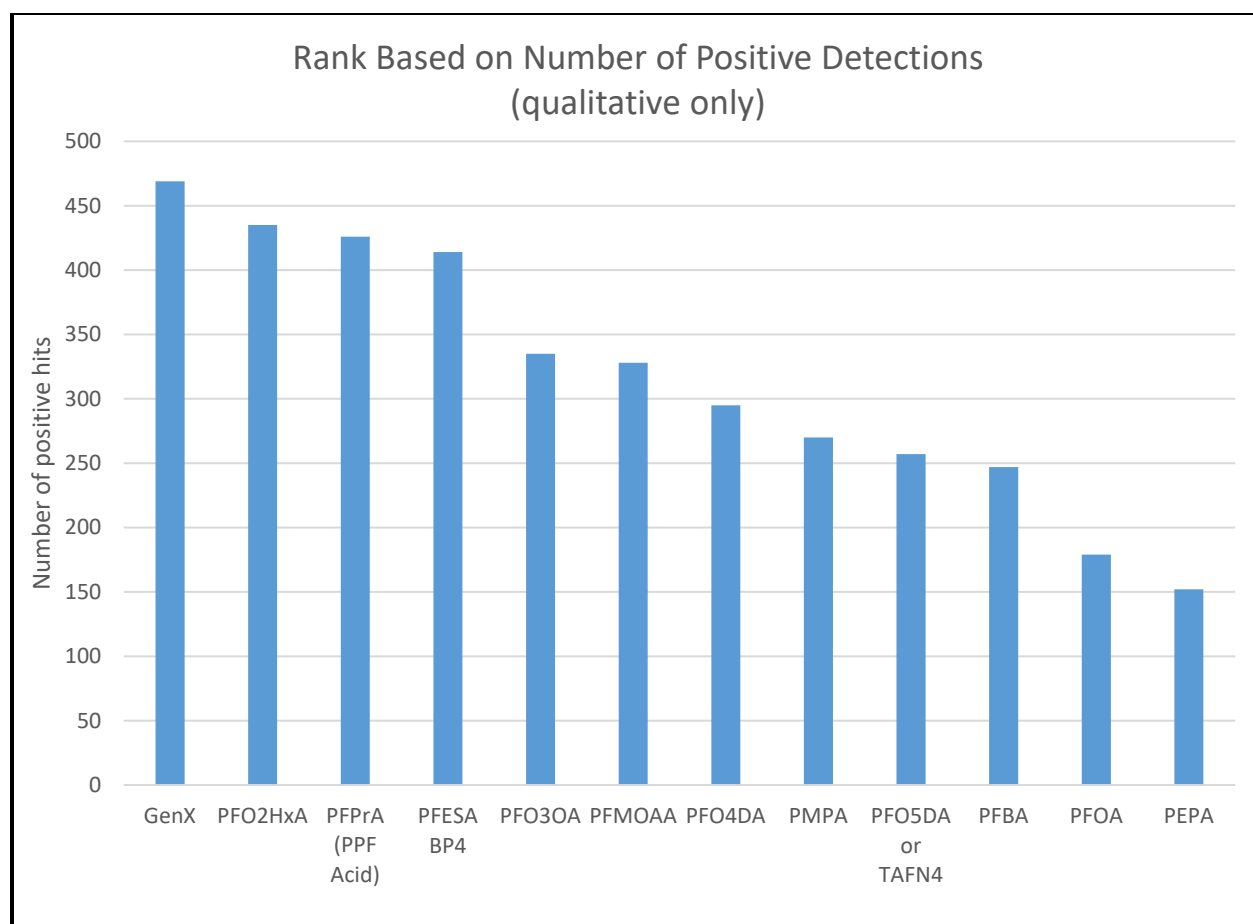
75. NCDEQ collects air and rainwater samples from five locations near the plant (see NCDEQ air monitoring locations on Figure 1, p. 2, above). These samples are tested by the agency for Fayetteville Works PFAS compounds. Results from 2022 and early 2023 continue to show that GenX is being deposited on properties near the bellwether properties at a level above the 10 ng/L (parts per trillion). Graphs illustrating the GenX wet deposition levels over time at the five NCDEQ monitoring station areas are included in further detail in Appendix J.

76. A graph for NCDEQ monitoring station 2, located just east of the Abril, Faircloth, and Stevens properties, shows a significant number of rainwater GenX concentrations remain above 10 ng/L (ppt, see red dashed line).

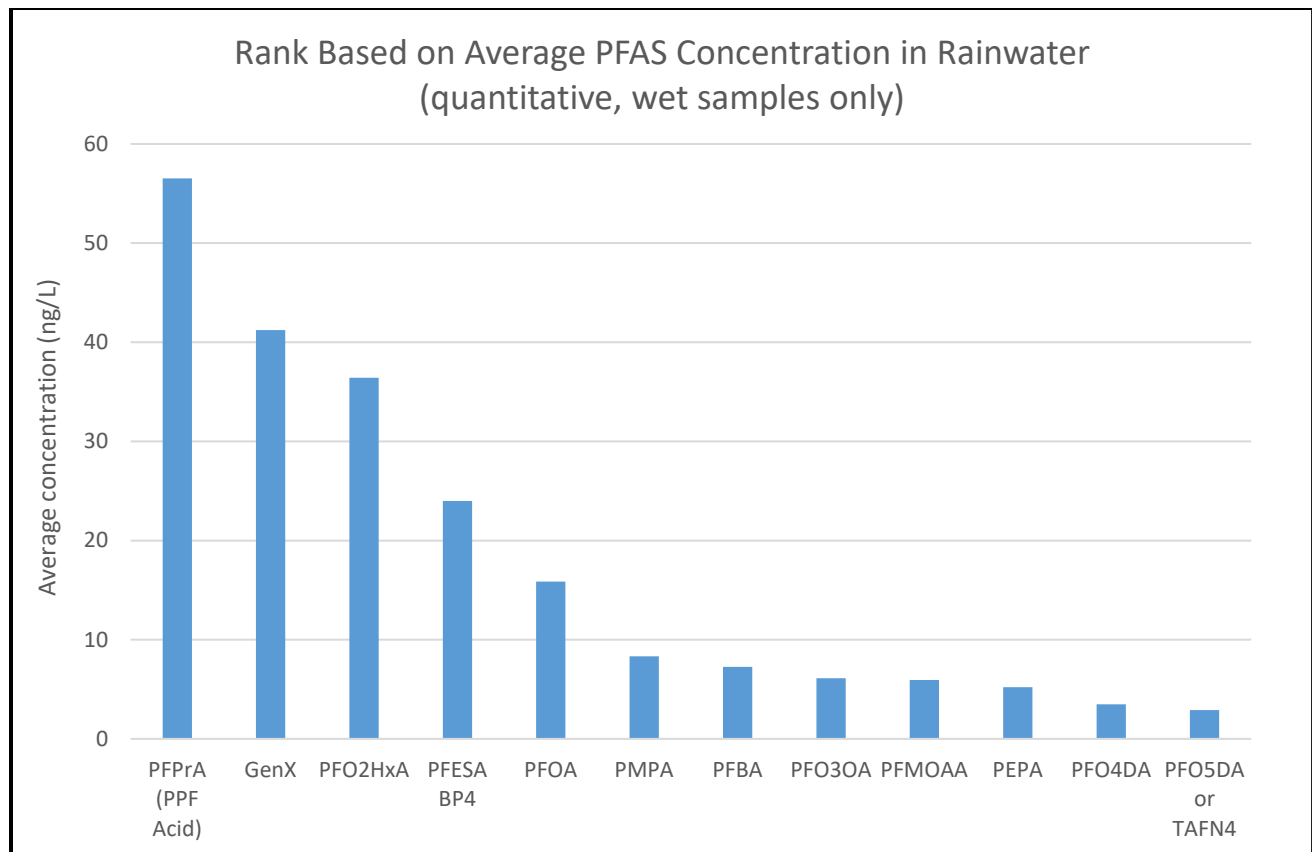


77. Figure 1 above (page 2) shows the NCDEQ air monitoring locations. These air monitoring locations, while not located exactly on the bellwether properties, are in close enough proximity to provide representative and reasonable data of air deposition conditions on the bellwether properties. Please note locations 21 and 21C have been combined.

78. From the NCDEQ wet/dry and rainfall deposition data (2022-current 2023), and a study by Zhou (Zhou, 2022), it is evident multiple PFAS contaminants from Fayetteville Works continue to be deposited (up through early 2023) on the area of the bellwether properties. The two charts below tally data provided by NCDEQ (NCDEQ, Brown, 2023) both qualitatively and quantitatively, showing the various PFAS contaminants that continue to be deposited across the area of the bellwether properties in spite of the thermal oxidizer and other controls used by Chemours.







## 5.2 No Active Remediation for Bellwether Properties in Chemours Cleanup Plan

79. Following the execution of the Consent Order with NCDEQ on February 25, 2019, the Geosyntec December 2019 CAP was prepared by Chemours (Geosyntec, Corrective Action Plan (Dec. 2019)). In the CAP, Chemours proposed certain response measures to prevent further contamination of the Cape Fear River. An Amendment to the Consent Order was entered into by Chemours and NCDEQ on October 12, 2020 (Addendum to the Consent Order, State of North Carolina v. Chemours Company FC, LLC (No. 17-CVS-580)). Together, the February 25, 2019 Consent Order, the August 13, 2020 Amendment to the Consent Order, the CAP, and other documents, outline measures to be purportedly undertaken by Chemours to prevent the further release of Fayetteville Works PFAS.

80. However, the plans, documents and Consent Order noted above do not include active soil, surface water, or groundwater remediation measures for the bellwether or other off-site properties impacted by air emissions.

81. Chemours' corrective action measures listed in the documents identified in paragraph 79 above do not include a full delineation of the horizontal and vertical extent of PFAS contaminants in the aquifer system on or around the bellwether properties. The actual shape of the PFAS contaminant plume has not yet been adequately defined in these areas. Without this information and given there has not been much time to determine the true movement behavior of PFAS contaminants in aquifer systems, there is uncertainty about future movements of these contaminants.

### **5.3 Complex Aquifer System and Groundwater Flow Paths**

82. Once deposited by air migration on surrounding properties in the Cape Fear River watershed, the migration of PFAS through the soil, groundwater, sediment, and surface water will take several decades to entirely flush through the system (Petre, 2021).

83. Regional hydrogeologic units under the Site have a heterogeneous mix of sands, silts and clays which will result in a complex movement over time of Fayetteville Works PFAS through groundwater.

84. The hydrogeological setting in the subsurface is complex with intermingled sand, silt and clay sediments comprising distinct, but discontinuous, aquifer units. Information taken from Chemours' Dec. 2019 CAP and Parsons' Focused Feasibility Study Report – PFAS Remediation (2018) lists the geological features at the Site from the surface downward as:

- Perched Groundwater Zone. The Perched Zone is a relatively thin, spatially limited layer of groundwater present in silty sands to a depth of about 20 feet below ground surface. The Perched Zone acts as a conduit for precipitation and Fayetteville Works PFAS to infiltrate into deeper geologic formations, and laterally into the Cape Fear River.
- Perched Clay Unit. The Perched Clay Unit beneath the Site at approximately 15 to 18 feet below ground surface presents a barrier to direct downward groundwater infiltration. However, the Perched Clay Unit is discontinuous and is spatially limited at the Site. To the north it pinches out. To the east and south, it outcrops along the bluff face. To the west, it terminates and becomes absent. The Perched Clay Unit is an aquitard, not an aquiclude. As such, it allows Fayetteville Works PFAS to continue migrating into deeper geologic strata; but it also conveys Fayetteville Works PFAS to the Cape Fear River.

- Surficial Aquifer. The Surficial Aquifer is an unconfined silty sand aquifer lying atop the Black Creek Confining Unit and is present beneath the Perched Clay Unit, approximately 50 feet below ground surface. It also acts as a conduit for precipitation and Fayetteville Works PFAS to infiltrate into deeper geologic formations, and laterally into the banks along Cape Fear River from which it then flows directly into the Cape Fear River.
- Black Creek Confining Unit. The Black Creek Confining Unit is a layer of silty or sandy clay that separates the Surficial Aquifer from the Black Creek Aquifer. It is located at approximately 65 feet below ground surface. It is an aquitard, not an aquiclude. As such, it allows Fayetteville Works PFAS to continue migrating into deeper geologic strata; but it also acts as a pan causing Fayetteville Works PFAS to migrate to the Cape Fear River.
- Flood Plain Deposits. Surficial soils in the flood plain immediately adjacent to the Cape Fear River are comprised of finer grained soil materials such as silts and clays, likely more recently deposited sediments during river flood stages. This geologic unit also allows Fayetteville Works PFAS to migrate vertically to lower geologic units, as well as horizontally.
- Black Creek Aquifer. The Black Creek Aquifer comprises fine to medium grained sands and is encountered at a depth between 80 and 100 feet below ground surface. The Black Creek Aquifer is interpreted to be the only transmissive groundwater zone at Site in direct contact with the Cape Fear River. As such, it acts as a direct conduit to discharge Fayetteville Works PFAS directly into the Cape Fear River.
- Upper Cape Fear Confining Unit. The Upper Cape Fear Confining Unit underlies the Black Creek Aquifer at approximately 100 feet below ground surface. The Upper Cape Fear Confining unit is a regionally extensive clay layer which is upwards of 75 feet (ft) thick at the Site and is likely a barrier to downwards groundwater flow. However, the top of the unit acts as a surface along which Fayetteville Works PFAS can travel to the Cape Fear River.

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**Appendix D**  
**Bellwether Property Analytical Testing Results**

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-1																
SYNTERRA ASSESSMENT RESULTS																
4216 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306																
CONFIDENTIAL CLIENT - 00.2158.03																
ABRIL PROPERTY																
Sample ID			AB-WSW-1		AB-HW-1		AB-CW-1		SW-1 (Northeast Inlet of Marshwood Lake)		SW-2 (Southeast Outlet of Marshwood Lake)		Sed-1 (Northeast Inlet of Marshwood Lake)		Sed-2 (Southeast Outlet of Marshwood Lake)	
Sample Date			3/1/2023	Q	3/1/2023	Q	3/1/2023	Q	3/1/2023	Q	3/2/2023	Q	3/1/2023	Q	3/2/2023	Q
Units			ng/L		ng/L		ng/L		ng/L		ng/L		ng/g		ng/g	
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #														
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	291		312		328		609		879		0.644		0.234	J
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	151		154		149		173		195		<0.301	U	<0.240	U
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	102		122		125		354		398		<0.301	U	<0.240	U
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	62.5		61.5		59.2		117		136		<0.301	U	<0.240	U
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	563		550		555		624		661		0.451		0.252	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<1.02	U	<1.02	U	<1.02	U	<1.02	U	<2.55	U	<0.301	U	<0.240	U
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<1.05	U	<1.05	U	<1.05	U	<2.13	U	<2.62	U	<0.301	U	<0.240	U
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<2.13	U	<2.13	U	<2.13	U	<2.13	U	<5.32	U	<0.301	U	<0.240	U
MMF	Diffuoromalonic acid	1514-85-8														
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9														
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	3.27		3.72		3.14	J	4.52		<1.23	U	<0.301	U	<0.240	U
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.962	U	<0.962	U	<0.962	U	<0.962	U	<2.40	U	<0.0502	U	<0.0400	U
PFCEA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.673	U	<0.673	U	<0.673	U	<0.673	U	<1.68	U	<0.0502	U	<0.0400	U
PFCEA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<0.427	U	<0.427	U	<0.427	U	<0.427	U	<1.07	U	<0.301	U	<0.240	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<1.71	U	<1.71	U	<1.71	U	<1.71	U	<4.28	U	<0.0502	U	<0.0400	U
PFESA BP2	Nafion Byproduct 2	749836-20-2	<2.65	U	3.93		4.49		20.8		15.1		<0.301	U	<0.240	U
PFHpA	Perfluoroheptanoic acid	375-85-9	<1.12	U	<1.12	U	<1.12	U	1.22	J	<2.80	U	<0.0277	U	<0.0221	U
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<5.37	U	<5.37	U	<5.37	U	<5.37	U	<13.4	U	<0.301	U	<0.240	U
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<1.14	U	<1.14	U	<1.14	U	<1.14	U	<2.85	U	<0.0502	U	<0.0400	U
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<1.47	U	2.73	J	2.78	J	35.5		45.7		<0.301	U	<0.240	U
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<2.53	U	<2.53	U	<2.53	U	<2.53	U	<6.32	U	<0.301	U	<0.247	U
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<2.56	U	<2.56	U	<2.56	U	<2.56	U	<6.40	U	<0.629	U	<0.501	U
PPF	Perfluoropropionic acid	422-64-0	1680		1490		1500		2980	E	1822		0.484	J	<0.240	
R-EVE	R-EVE	2416366-22-6	<5.31	U	<5.31	U	<5.31	U	<5.31	U	13.5	J	<0.301	U	<0.240	U
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<14.1	U	<14.1	U	<14.1	U	<14.1	U	<35.2	U	<0.301	U	<0.240	U
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<1.35	U	<1.35	U	<1.35	U	<1.35	U	<3.38	U	<0.301	U	<0.240	U
Notes:													Created By: RBP		Checked By: TCM	
Bold: Concentration above the Minimum Detection Limit (MDL)																
□: blank cell indicate compounds were not tested for.																
Q: Data Qualifier																
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.																
I3: Estimated - sample matrix interference determination not accurate																
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve																
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit																
*: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased																
*: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased																
E: Result exceeded calibration range																
*1: Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits																
WSW: Water supply well																
SW - Surface water																
Sed: Sediment																
CW: Cold water from kitchen faucet																
HW: Hot water from kitchen faucet																
ng/L: nanograms/liter; parts per trillion, ppt																
ng/g: nanograms/liter; parts per billion, ppb																

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-2									
SYNTERRA ASSESSMENT RESULTS									
21 WEST SHAW MILL ROAD, ST PAULS, NORTH CAROLINA 28384									
CONFIDENTIAL CLIENT - 00.2158.03									
BRANCH PROPERTY									
Sample ID			Location A		BR-CW-1		BR-HW-1		
Sample Date			1/30/2023	Q	3/1/2023	Q	3/1/2023	Q	
Units			ng/L		ng/L		ng/L		
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	5.32		8.12		7.82		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	8.00		6.75		6.01		
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	22.3		15.7		17.6		
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	14.1	*-	14.2		12.7		
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	88.4		98.5		93.5		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<8.26	U*_*1	<1.02	U	<1.02	U	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<1.65	U	<1.05	U	<1.05	U	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1			<2.13	U	<2.13	U	
MMF	Difluoromalonid acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	<4.13	U					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	1.67		2.02	J	0.986	J	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<1.65		<0.962	U	<0.962	U	
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<1.65	U	<0.673	U	<0.673	U	
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<1.65	U	<0.427	U	<0.427	U	
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<8.26	U*_*1	<1.71	U	<1.71	U	
PFESA BP2	Nafion Byproduct 2	749836-20-2	9.34		8.44		6.56		
PFHpA	Perfluoroheptanoic acid	375-85-9	<1.65	U	<1.12	U	<1.12	U	
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<1.65	U	<5.37	U	<5.37	U	
PFMOPra/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<1.65	U	<1.14	U	<1.14	U	
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	0.87	J	<1.47	U	<1.47	U	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<1.65	U	<2.53	U	<2.53	U	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<4.13	U	<2.56	U	<2.56	U	
PPF	Perfluoropropionic acid	422-64-0	169		493		422		
R-EVE	R-EVE	2416366-22-6	0.977	J	<5.31	U	<5.31	U	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0			<14.1	U	<14.1	U	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5			<1.35	U	<1.35	U	
Notes:			Created By: RBP    Checked By: TCM						
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicate compounds were not tested for.									
Q: Data Qualifer									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
E: Result exceeded calibration range									
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
Location A- water supply well sample location									
WSW- water supply well									
CW- cold water from kitchen faucet									
HW - hot water from kitchen faucet									
ng/L: nanograms/liter: ppt									
µg/L: micograms/liter: ppb									

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-3						
SYNTERRA ASSESSMENT RESULTS						
37 WEST SHAW MILL ROAD, ST PAULS, NORTH CAROLINA 28384						
CONFIDENTIAL CLIENT - 00.2158.03						
BRANCH PROPERTY						
Sample ID			BR-37-WSW-1		BR-37-WSW-1	
Sample Date			4/19/2023	Q	4/19/2023	DUP
Units			ng/L		ng/L	
Acronym	Per- and Polyfluorinated Substances (PFAS)	CAS- #				
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	2.52	J	2.39	J
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	4.57	J	4.9	J
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	<2.06	U	5.48	J
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	9.65		9.92	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	73.1		82.1	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<2.04	U	<2.04	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<2.10	U	<2.10	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.986	U	<0.986	U
MMF	Difluoromalonic acid	1514-85-8				
MTP	Perfluoro-2-methoxypropanoic	93449-21-9				
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.986	U	<0.986	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<1.92	U	<1.92	
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<1.35	U	<1.35	
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<0.854	U	<0.854	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<3.42	U	<3.42	
PFESA BP2	Nafion Byproduct 2	749836-20-2	<5.30	U	<5.30	
PFPrA	Perfluoroheptanoic acid	422-64-0	108	J	111	J
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<10.7	U	<10.7	
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<2.28	U	<2.28	
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<2.94	U	<2.94	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<5.06	U	<5.06	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<5.12	U	<5.12	
PPF	Perfluoropropionic acid	422-64-0	108	J	111	J
R-EVE	R-EVE	2416366-22-6	<10.6	U	<10.6	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<28.2	U	<28.2	U
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<2.70	U	<2.70	U
Notes:			Created By: RBP		Checked By: TCM	
Bold: Concentration above the Minimum Detection Limit (MDL)						
□: blank cell indicate compounds were not tested for.						
Q: Data Qualifier						
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.						
J3: Estimated - sample matrix interference determination not accurate						
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve						
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit						
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased						
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased						
E: Result exceeded calibration range						
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits						
WSW - water supply well						
ng/L: nanograms/liter: ppt						
µg/L: micograms/liter: ppb						



## Expert Report of David L. Duncklee, P.G.

APPENDIX D-4									
SYNTERRA ASSESSMENT RESULTS									
7242 FIRE DEPARTMENT ROAD, HOPE MILLS, NORTH CAROLINA 28348									
CONFIDENTIAL CLIENT - 00.2158.03									
DAVIS PROPERTY									
Sample ID			DA-WSW-1		DA-HW-1		DA-CW-1		
Sample Date			3/1/2023	Q	3/1/2023	Q	3/1/2023	Q	
Units			ng/L		ng/L		ng/L		
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	156		155		172		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	132		104		115		
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	104		49.7		41.6		
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	121		50.5		54.3		
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	613		453		495		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<1.02	U	<1.02	U	<1.02	U	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<1.05	U	<1.05	U	<1.05	U	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<2.13	U	<2.13	U	<2.13	U	
MMF	Difluoromalononic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9							
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	3.04	J	3.49		3.55		
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.962	U	<0.962	U	<0.962	U	
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.673	U	<0.673	U	<0.673	U	
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<0.427	U	<0.427	U	<0.427	U	
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<1.71	U	<1.71	U	<1.71	U	
PFESA BP2	Nafion Byproduct 2	749836-20-2	2.67		5.48		7.27		
PFHpA	Perfluoroheptanoic acid	375-85-9	<1.12	U	<1.12	U	<1.12	U	
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<5.37	U	<5.37	U	<5.37	U	
PFMOPra/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<1.14	U	<1.14	U	<1.14	U	
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<1.47	U	<1.47	U	<1.47	U	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<2.53	U	<2.53	U	<2.53	U	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<2.56	U	<2.56	U	<2.56	U	
PPF	Perfluoropropionic acid	422-64-0	3490		2180	E	2510	E	
R-EVE	R-EVE	2416366-22-6	<5.31	U	5.75	J	7.47		
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<14.1	U	17.9		18.8		
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<1.35	U	<1.35	U	<1.35	U	
Notes:					Created By: RBP      Checked By: TCM				
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicate compounds were not tested for.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
J3: Estimated - sample matrix interference determination not accurate									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
E: Result exceeded calibration range, value shown is post-data validation									
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
WSW: Water supply well									
CW: Cold water from kitchen faucet									
HW: Hot water from kitchen faucet									
ng/L: nanograms/liter: ppt									
µg/L: micograms/liter: ppb									

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-5																			
SYNTERRA ASSESSMENT RESULTS																			
3884 TRANQUILITY ROAD, FAYETTEVILLE, NORTH CAROLINA 28306																			
CONFIDENTIAL CLIENT - 00.2158.03																			
FAIRCLOTH PROPERTY																			
Sample ID			FA-CW-1		FA-HW-1		FA-HWD-1 (Duplicate)		FA-WSW-1		SW-3 (Willis Creek)		SW-4 (Willis Creek)		Sed-3 (Willis Creek)		Sed-4 (Willis Creek)		
Sample Date			3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	
Units			ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/g		ng/g		
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#																	
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	74.9		77.9		76.8		76.3		125		129		0.0275	J	<0.0225	U	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	15.9		17.4		17.1		17.6		29.5		30		<0.249	U	<0.227	U	
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	18.5		18.8		16.5		16.2		68.8		74.8		<0.249	U	<0.227	U	
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	6.92		6.90		7.04		7.55		39.9		37.5		<0.249	U	<0.227	U	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	90.2		96.6		94.5		100		138		140		<0.256	U	<0.223	U	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<0.175	U	<0.176	U	<0.178	U	<0.184	U	<2.55	U	<3.40	U	<0.249	U	<0.227	U	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.180	U	<0.181	U	<0.183	U	<0.189	U	<2.62	U	<3.50	U	<0.249	U	<0.227	U	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.366	U	<0.368	U	<0.371	U	<0.384	U	<5.32	U	<7.10	U	<0.249	U	<0.227	U	
	MMF	Diffuoromalononic acid	1514-85-8																
MTP	Perfluoro-2-methoxypropanoic	93449-21-9																	
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	0.519	J	0.84		0.384	J	0.541	J	<1.23	U	<1.64	U	<0.249	U	<0.227	U	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.165	U	<0.166	U	<0.168	U	<0.173	U	<2.40	U	<3.21	U	<0.0415	U	<0.0378	U	
PFESA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.116	U	<0.116	U	<0.117	U	<0.121	U	<1.68	U	<2.24	U	<0.0415	U	<0.0378	U	
PFESA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<0.0733	U	<0.0738	U	<0.0744	U	<0.0769	U	<1.07	U	<1.42	U	<0.249	U	<0.227	U	
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<0.294	U	<0.296	U	<0.298	U	<0.308	U	<4.28	U	<5.70	U	<0.0415	U	<0.227	U	
PFESA BP2	Nafion Byproduct 2	749836-20-2	<0.455	U	<0.458	U	<0.462	U	<0.478	U	<6.62	U	<8.83	U	<0.249	U	<0.227	U	
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.192	U	<0.194	U	<0.195	U	<0.202	U	<2.80	U	<3.73	U	<0.0229	U	<0.0209	U	
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<0.922	U	<0.928	U	<0.935	U	<0.968	U	<13.4	U	<17.9	U	<0.249	U	<0.227	U	
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.196	U	<0.197	U	<0.199	U	<0.205	U	<2.85	U	<3.80	U	<0.0415	U	<0.0378	U	
PFO3OA	Perfluoro (3,5,7-triaxaoctanoic) acid	39492-89-2	<0.252	U	<0.254	U	<0.256	U	<0.265	U	<3.68	U	<4.90	U	<0.249	U	<0.227	U	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.434	U	<0.437	U	<0.441	U	<0.456	U	<6.32	U	<8.43	U	<0.256	U	<0.233	U	
PFO5DA	Perfluoro-3,5,7,9,11-pentaaxadodecanoic acid	39492-91-6	<0.440	U	<0.442	U	<0.446	U	<0.461	U	<6.40	U	<8.53	U	<0.521	U	<0.474	U	
PPF	Perfluoropropionic acid	422-64-0	244		240		246		252		366	J	399	J	<0.0850	U	<0.0997	U	
R-EVE	R-EVE	2416366-22-6	3.48		3.50		3.80		3.38		<13.3	U	<17.7	U	<0.249	U	<0.227	U	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	4.53		5.30		5.04		4.41		<35.2	U	<47.0	U	<0.249	U	<0.227	U	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5	<0.232	U	<0.233	U	<0.235	U	<0.243	U	<3.38	U	<4.50	U	<0.249	U	<0.227	U	
Notes:															Created By: RBP			Checked By: TCM	
<b>Bold:</b> Concentration above the Minimum Detection Limit (MDL)																			
[]: blank cell indicate compounds were not tested for.																			
Q: Data Qualifier																			
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.																			
J3: Estimated - sample matrix interference determination not accurate																			
PS: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve																			
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit																			
*: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased																			
** : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased																			
E: Result exceeded calibration range																			
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits																			
WSW: Water supply well																			
SW: Surface water																			
Sed: Sediment																			
CW- cold water from kitchen faucet																			
HW - hot water from kitchen faucet																			
ng/L: nanograms/liter; parts per trillion, ppt																			
ng/g: nanograms per gram, parts per billion, ppb																			

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-6									
SYNTERRA ASSESSMENT RESULTS									
405 JAX COURT, FAYETTEVILLE, NORTH CAROLINA 28312									
CONFIDENTIAL CLIENT - 00.2158.03									
PINI PROPERTY									
Sample ID			Location C		PI-HW-1		PI-CW-1		PI-CWD-1 (Duplicate)
Sample Date			1/30/2023	Q	3/1/2023	Q	3/1/2023	Q	3/1/2023
Units			ng/L		ng/L		ng/L		ng/L
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<2.49		<0.565	U	<0.565	U	<0.565
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	0.424	J	<1	U	<1		<1
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	0.248	J	<1.72	U	<1.72	U	<1.72
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	2.00	*-	<2.70	U	<2.70	U	<2.70
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	17.5		19.1		17.4		18.6
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<8.31	U*-*1	<1.70	U	<1.70	U	<1.70
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<1.66	U	<1.75	U	<1.75	U	<1.75
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1			<3.55	U	<3.55	U	<3.55
MMF	Difluoromalonic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	<4.16	U					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	0.738	J	<0.822	U	<0.822	U	<0.822
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<1.66	U	<1.60	U	<1.60	U	<1.60
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<1.66	U	<1.12	U	<1.12	U	<1.12
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<1.66	U	<0.712	U	<0.712	U	<0.712
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<8.31	U*-*1	<2.85	U	<2.85	U	<2.85
PFESA BP2	Nafion Byproduct 2	749836-20-2	0.622	J	<4.42	U	<4.42	U	<4.42
PFHpA	Perfluoroheptanoic acid	375-85-9	<1.66	U	<1.87	U	<1.87	U	<1.87
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<1.66	U	<8.95	U	<8.95	U	<8.95
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1			<1.90	U	<1.90	U	<1.90
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	<1.66	U	<2.45	U	<2.45	U	<2.45
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<1.66	U	<8.95	U	<8.95	U	<8.95
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<4.16		<4.27	U	<4.27	U	<4.27
PPF	Perfluoropropionic acid	422-64-0	50.6		68.3	J	87.6	J	74.8
R-EVE	R-EVE	2416366-22-6	<1.66	U	<8.85	U	<8.85	U	<8.85
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0			<23.5	U	<23.5	U	<23.5
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5			<2.25	U	<2.25	U	<2.25
Notes:					Created By: RBP		Checked By: TCM		
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicate compounds were not tested for.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
J3: Estimated - sample matrix interference determination not accurate									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
WSW- water supply well									
Location C- water supply well sample location									
CW- cold water from kitchen faucet									
HW- hot water from kitchen faucet									
ng/L: nanograms/liter: ppt									
µg/L: micrograms/liter: ppb									

## Expert Report of David L. Duncklee, P.G.

APPENDIX D-7										
SYNTERRA ASSESSMENT RESULTS										
7619 HWY 87 SOUTH, FAYETTEVILLE, NORTH CAROLINA 28306										
CONFIDENTIAL CLIENT - 00.2158.03										
STEVENS PROPERTY										
Sample ID			ST-WSW-1		ST-WSW-2		ST-CW-1		ST-HW-1	
Sample Date			3/2/2023	Q	3/2/2023	Q	3/2/2023	Q	3/2/2023	Q
Units			ng/L		ng/L		ng/L		ng/L	
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#								
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	423		18.3		331		369	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	143		7.52		117		134	
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	340		<1.72	U	213		203	
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	119		<2.70	U	106		95.1	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	669		53.8		649		626	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<2.55	U	<1.70	U	<3.40	U	<3.40	U
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	5.19	J	<1.75	U	<3.50	U	<3.50	U
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<5.32	U	<3.55	U	<7.10	U	<7.10	U
MMF	Difluoromalonic acid	1514-85-8								
MTP	Perfluoro-2-methoxypropanoic	93449-21-9								
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<1.23	U	<0.822	U	4.33	J	<1.64	U
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<2.40	U	<1.60	U	<3.21	U	<3.21	U
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<1.68	U	<1.12	U	<2.24	U	<2.24	U
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<1.07	U	<0.712	U	<1.42	U	<1.42	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<4.28	U	<2.85	U	<5.70	U	<5.70	U
PFESA BP2	Nafion Byproduct 2	749836-20-2	33		<4.42	U	21.5		20.3	
PFFHpA	Perfluoroheptanoic acid	375-85-9	<2.80	U	<1.87	U	<3.73	U	<3.73	U
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<13.4	U	<8.95	U	<17.9	U	<17.9	U
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<2.85	U	<1.90	U	<3.80	U	<3.80	U
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	58		<2.45	U	26.5		41.9	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<6.32	U	<4.22	U	<8.43	U	<8.43	U
PFO5DA	Perfluoro-3,5,7,9,11-pentaaxadodecanoic acid	39492-91-6	<6.40	U	<4.27	U	<8.53	U	<8.53	U
PPF	Perfluoropropionic acid	422-64-0	2120		69.6	J	1890		2180	
R-EVE	R-EVE	2416366-22-6	71.5		<8.85	U	54.5		64.7	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	73.4		<23.5	U	51		54.1	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<3.38	U	<2.25	U	<4.50	U	<4.50	U
Notes:							Created By: RBP		Checked By: TCM	
<b>Bold:</b> Concentration above the Minimum Detection Limit (MDL)										
□: blank cell indicate compounds were not tested for.										
Q: Data Qualifier										
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.										
J3: Estimated - sample matrix interference determination not accurate										
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve										
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit										
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased										
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased										
E: Result exceeded calibration range										
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits										
WSW-1: Water supply well - connected to main house										
WSW-2: Water supply well - used for watering yard and washing vehicles										
CW: Cold water from kitchen faucet										
HW: Hot water from kitchen faucet										
ng/L: nanograms/liter: ppt										
ug/L: micrograms/liter: ppb										

**Appendix E**  
**Hot Water Heater Testing Results**  
**Bellwether Properties and Sessoms Property**



## Expert Report of David L. Duncklee, P.G.

APPENDIX E-1							
HOT WATER HEATER SEDIMENT							
4216 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306							
CONFIDENTIAL CLIENT - 00.2158.03							
ABRIL PROPERTY							
Sample ID			Ab-WH-1				
Sample Date			5/1/2023		Q		
Units			ppt				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<17800	U	H		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<5350	U	H		
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	<5350	U	H		
PFMOAA	Perfluoro (3,5-dioxaheptanoic) acid	674-13-5	<5350	U	H		
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	3280	J	H		
Byproduct 4	Perfluoro-4-(2-sulfoethoxy)pentanoic acid	2416366-18-0	<5350	U	H		
Byproduct 5	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<5350	U	H		
Byproduct 6	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid	2416366-21-5	<5350	U	H		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<5350	U	H		
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<5350	U	H		
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1					
MMF	Difluoromaleonic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9	<5350	U	H		
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8					
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<5350	U	H		
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<5350	U	H		
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<5350	U	H		
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<5350	U	H		
PFESA BP2	Nafion Byproduct 2	749836-20-2	<5350	U	H		
PFHpA	Perfluoroheptanoic acid	375-85-9	<5350	U	H		
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<5350	U	H		
PFMOPra/PF MPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<5350	U	H		
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<5350	U	H		
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<5350	U	H		
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<5350	U	H		
PPF	Perfluoropropionic acid	422-64-0	3570	J	H	B	
R-EVE	R-EVE	2416366-22-6	<5350	U	H	*-	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0					
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5					
Notes:		Created By: RBP	Checked By: TCM				
Bold: Concentration above the Minimum Detection Limit (MDL)							
□: blank cell indicates compound was not tested for.							
Q: Data Qualifier							
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values							
U: The analyte was not detected.							
B: Compound was found in blank sample.							
H: Sample was prepped or analyzed beyond the specified holding time.							
HW: Hot Water							
Sed: Sediment							
WH: Water Heater							
ppt: parts per trillion							

APPENDIX E-2				
HOT WATER HEATER SEDIMENT				
21 WEST SHAW MILL ROAD, ST PAULS, NORTH CAROLINA 28384				
CONFIDENTIAL CLIENT - 00.2158.03				
BRANCH PROPERTY				
Sample ID			BR-HW-Sed-1	
Sample Date			3/27/2023	Q
Units			ng/g	
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #		
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.624	U
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<6.31	U
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	<6.31	U
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	<6.31	U
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	<6.48	U
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<6.31	U
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<6.31	U
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<6.31	U
MMF	Difluoromalonic acid	1514-85-8		
MTP	Perfluoro-2-methoxypropanoic	93449-21-9		
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<6.31	U
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<1.05	U
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<1.05	U
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<6.31	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<1.05	U
PFESA BP2	Nafion Byproduct 2	749836-20-2	<6.31	U
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.581	U
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<6.31	U
PFMOPrA/PFMPPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<1.05	U
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<6.31	U
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<6.48	U
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<13.2	U
PPF	Perfluoropropionic acid	422-64-0	9.38	J
R-EVE	R-EVE	2416366-22-6	<6.31	U
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<6.31	U
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5	<6.31	U
Notes:		Created by: RBP	Checked By: TCM	
Bold: Concentration above the Minimum Detection Limit (MDL)				
□: blank cell indicates compound not tested.				
Q: Data Qualifer				
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.				
WSW: Water supply well				
Sed: Sediment				
HW: Hot water				
ng/g: nanograms/gram: parts per billion, ppb				

## Expert Report of David L. Duncklee, P.G.

APPENDIX E-3									
HOT WATER HEATER SEDIMENT DATA									
7242 FIRE DEPARTMENT ROAD, HOPE MILLS, NORTH CAROLINA 28348									
CONFIDENTIAL CLIENT - 00.2158.03									
DAVIS PROPERTY									
Sample ID						Da-WH-1			
Sample Date						5/1/2023	Q		
Units						ppt			
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<47900	U	H				
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<14400	U	H				
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	<14400	U	H				
PFMOAA	Perfluoro (3,5-dioxaheptanoic) acid	39492-88-1	<14400	U	H				
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	12800	J	H				
Byproduct 4	Perfluoro-4-(2-sulfoethoxy)pentanoic acid	2416366-18-0	<14400	U	H				
Byproduct 5	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<14400	U	H				
Byproduct 6	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid	2416366-21-5	<14400	U	H				
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<14400	U	H				
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9							
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1							
MMF	Difluoromalonic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	<14400	U	H				
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8							
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<14400	U	H				
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<14400	U	H				
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<14400	U	H				
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<14400	U	H				
PFESA BP2	Nafion Byproduct 2	749836-20-2	<14400	U	H				
PFHpA	Perfluoroheptanoic acid	375-85-9	<14400	U	H				
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<14400	U	H				
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1							
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<14400	U	H				
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<14400	U	H				
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<14400	U	H				
PPF	Perfluoropropionic acid	422-64-0	16800	H	B				
R-EVE	R-EVE	2416366-22-6	<14400	U	H			*	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0							
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5							
Notes:		Created By: RBP	Checked By: TCM						
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicates compound not tested.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values									
J3: Estimated - sample matrix interference determination not accurate									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
*: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
E: Result exceeded calibration range									
*1: Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
H: Sample was prepped or analyzed beyond the specified holding time.									
B: Compound was found in the blank and sample.									
WSW: Water supply well									
Sed: Sediment									
HW: Hot water									
WH: Water heater									
ppt: parts per trillion									

## Expert Report of David L. Duncklee, P.G.

APPENDIX E-4									
HOT WATER HEATER SEDIMENT DATA									
3884 TRANQUILITY ROAD, FAYETTEVILLE, NORTH CAROLINA 28306									
CONFIDENTIAL CLIENT - 00.2158.03									
FAIRCLOTH PROPERTY									
Sample ID			Fa-HW-Sed-1		Fa-WH-1				
Sample Date			3/27/2023	Q	5/1/2023	Q			
Units			ng/g		ppt				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.791	U	<14100	U	H		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<8.00	U	<4230	U	H		
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	<8.00	U	<4230	U	H		
PFMOAA	Perfluoro (3,5-dioxaheptanoic) acid	39492-88-1	<8.00	U	<4230	U	H		
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	<8.22	U	<4230	U	H		
Byproduct 4	Perfluoro-4-(2-sulfoethoxy)pentanoic acid	2416366-18-0			<4230	U	H		
Byproduct 5	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1			<4230	U	H		
Byproduct 6	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid	2416366-21-5			<4230	U	H		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<8.00	U	<4230	U	H		
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<8.00	U	<4230	U	H		
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<8.00	U					
MMF	Difluoromalononic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9			<4230	U	H		
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<8.00	U					
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<1.33	U	<4230	U	H		
PFESA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<1.33	U	<4230	U	H		
PFESA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<8.00	U	<4230	U	H		
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<1.33	U	<4230	U	H		
PFESA BP2	Nafion Byproduct 2	749836-20-2	<8.00	U	<4230	U	H		
PFHpA	Perfluoroheptanoic acid	375-85-9			<4230	U	H		
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<8.00	U	<4230	U	H		
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<1.33	U	<4230	U	H		
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<1.33	U	<4230	U	H		
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<8.00	U	<4230	U	H		
PFO5DA	Perfluoro-3,5,7,9,11-pentaaxadodecanoic acid	39492-91-6	<8.22	U	<4230	U	H		
PPF	Perfluoropropionic acid	422-64-0	<16.7	U	<b>2430</b>	J	H	B	
R-EVE	R-EVE	2416366-22-6	<8.00	U	<4230	U	H	*	-
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<8.00	U					
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5	<8.00	U					
Notes:				Created By: RBP		Checked By: TCM			
<b>Bold:</b> Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicates compound not tested.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
B: Compound was found in the blank and sample.									
H: Sample was prepped or analyzed beyond the specified holding time.									
* -: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
Sed: Sediment									
HW: Hot water									
WH: Water heater									
ng/g: nanograms/gram: parts per billion, ppb									
ppt: parts per trillion									

## Expert Report of David L. Duncklee, P.G.

APPENDIX E-5									
HOT WATER HEATER SEDIMENT DATA									
405 JAX COURT, FAYETTEVILLE, NORTH CAROLINA 28312									
CONFIDENTIAL CLIENT - 00.2158.03									
PINI PROPERTY									
			Sample ID		PI-WH-1				
			Sample Date		5/1/2023		Q		
			Units		ppt				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<57800	U	H				
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<17300	U	H				
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	<17300	U	H				
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	<17300	U	H				
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	<17300	U	H				
Byproduct 4	Perfluoro-4-(2-sulfoethoxy)pentanoic acid	2416366-18-0	<17300	U	H	F1	F2		
Byproduct 5	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<17300	U	H	F1			
Byproduct 6	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid	2416366-21-5	<17300	U	H				
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<17300	U	H				
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<17300	U	H				
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1							
MMF	Difluoromalonic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	<17300	U	H				
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8							
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<17300	U	H				
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<17300	U	H				
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<17300	U	H				
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<17300	U	H				
PFESA BP2	Nafion Byproduct 2	749836-20-2	<17300	U	H				
PFHpA	Perfluoroheptanoic acid	375-85-9	<17300	U	H				
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<17300	U	H				
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<17300	U	H				
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<17300	U	H				
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<17300	U	H				
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<17300	U	H				
PPF	Perfluoropropionic acid	422-64-0	<17300	U	H				
R-EVE	R-EVE	2416366-22-6	<17300	U	H	F1	*		
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0							
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5							
Notes:		Created By: RBP		Checked By: TCM					
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicates compound not tested.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
H: Sample was prepped or analyzed beyond the specified holding time.									
F1: Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery exceeds control limits									
F2: MS/MSD RPD exceeds control limits									
* -: Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
Sed: Sediment									
HW: Hot water									
WH: Water heater									
ppt: parts per trillion									



## Expert Report of David L. Duncklee, P.G.

APPENDIX E-6									
HOT WATER HEATER SEDIMENT DATA									
7619 HWY 87 SOUTH, FAYETTEVILLE, NORTH CAROLINA 28306									
CONFIDENTIAL CLIENT - 00.2158.03									
STEVENS PROPERTY									
Sample ID			St-HW-Sed-1		St-WH-1				
Sample Date			3/27/2023	Q	5/1/2023			Q	
Units			ng/g		ppt				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	3.84	J	<4890	U	H		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<4.32	U	<1470	U	H		
PFO2HxA	Perfluoro-2-methoxyacetic acid	674-13-5	<4.32	U	1150	J	H		
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	<4.32	U	620	J	H		
PMMA	Perfluoro-2-methoxypropanoic acid	13140-29-9	10.6		3060	H			
Byproduct 4	Perfluoro-4-(2-sulfoethoxy)pentanoic acid	2416366-18-0			<1470	U	H		
Byproduct 5	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1			<1470	U	H		
Byproduct 6	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid	2416366-21-5			<1470	U	H		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<4.32	U	<1470	U	H		
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<4.32	U	<1470	U	H		
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<4.32	U					
MMF	Difluoromalononic acid	1514-85-8			<1470	U	H		
MTP	Perfluoro-2-methoxypropanoic	93449-21-9							
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<4.32	U					
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.720	U	<1470	U	H		
PFCEA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.720	U	<1470	U	H		
PFCEA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<4.32	U	<1470	U	H		
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<0.720	U	<1470	U	H		
PFESA BP2	Nafion Byproduct 2	749836-20-2	<4.32	U	<1470	U	H		
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.398	U	<1470	U	H		
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<4.32	U					
PFMOPrA/PFMMA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.720	U	<1470	U	H		
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<4.32	U	<1470	U	H		
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<4.44	U	<1470	U	H		
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<9.02	U	<1470	U	H		
PPF	Perfluoropropionic acid	422-64-0	8.20	J	4640	H	B		
R-EVE	R-EVE	2416366-22-6	<4.32	U	<1470	U	H		*-
R-PSDA	2,2,3,3,4,4,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<4.32	U					
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5	<4.32	U					
Notes:			Created By: RBP		Checked By: TCM				
Bold: Concentration above the Minimum Detection Limit (MDL)									
□: blank cell indicates compound not tested.									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
J3: Estimated - sample matrix interference determination not accurate									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
E: Result exceeded calibration range									
*1: Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
H: Sample was prepped or analyzed beyond the specified holding time.									
B: Compound was found in the blank and sample.									
Sed: Sediment									
HW: Hot water									
WH: Water heater									
ng/g: nanograms/gram: ppb									
ppt: parts per trillion									

APPENDIX E-7						
HOT WATER HEATER SEDIMENT AND SCALE TESTING						
4024 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306						
CONFIDENTIAL CLIENT - 00.2158.03						
SESSOMS PROPERTY						
Sample ID			SES-HW-SED-1		SES-HW-SCA-1	
Sample Date			4/19/2023	Q	4/19/2023	Q
Units			ng/g		ng/g	
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #				
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	1.40		30.4	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	0.744		13.8	
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	<0.651	U	<3.18	U
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	<0.651	U	<3.18	U
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	3.09		32.4	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	<0.651	U	<3.18	U
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.651	U	<3.18	U
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-22-6	<0.651	U	95.7	
MMF	Difluoromalononic acid	1514-85-8				
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9				
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.651	U	7.51	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.109	U	<0.529	U
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<0.109	U	<0.529	U
PFECA G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	<0.651	U	<3.18	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	1.48		78.5	
PFESA BP2	Nafion Byproduct 2	749836-20-2	<0.651	U	25.2	
PFPrA	Perfluoroheptanoic acid	422-64-0	5.37	J	19.1	J
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5	<0.651	U	<3.18	U
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.109	U	<0.529	U
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<0.651	U	<3.18	U
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.670	U	<3.26	U
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<1.36	U	<6.64	U
PPF	Perfluoropropionic acid	422-64-0	5.37	J	19.1	J
R-EVE	R-EVE	2416366-22-6	<0.651	U	<3.18	U
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<0.651	U	<3.18	U
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]	241636-21-5	<0.651	U	<3.18	U
Notes:			Created By: RBP		Checked By: SVL	
Bold: Concentration above the Minimum Detection Limit (MDL)						
Q: Data Qualifier						
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.						
U: The analyte was not detected.						
SED: Sediment						
SCA: Scale						
ng/g: nanograms/gram: ppb						

**Appendix F**  
**Maps of Bellwether Properties with Sampling Locations**



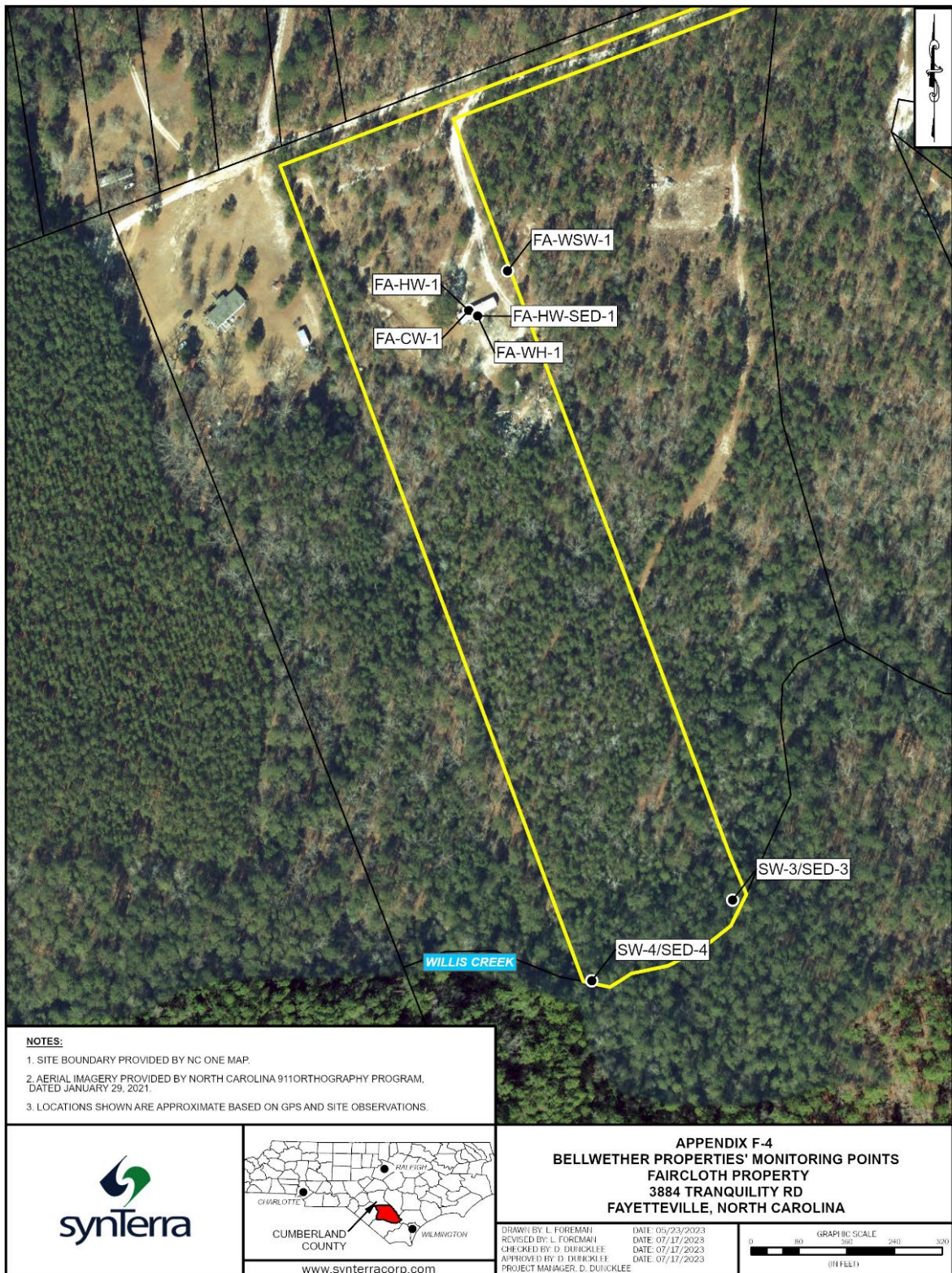




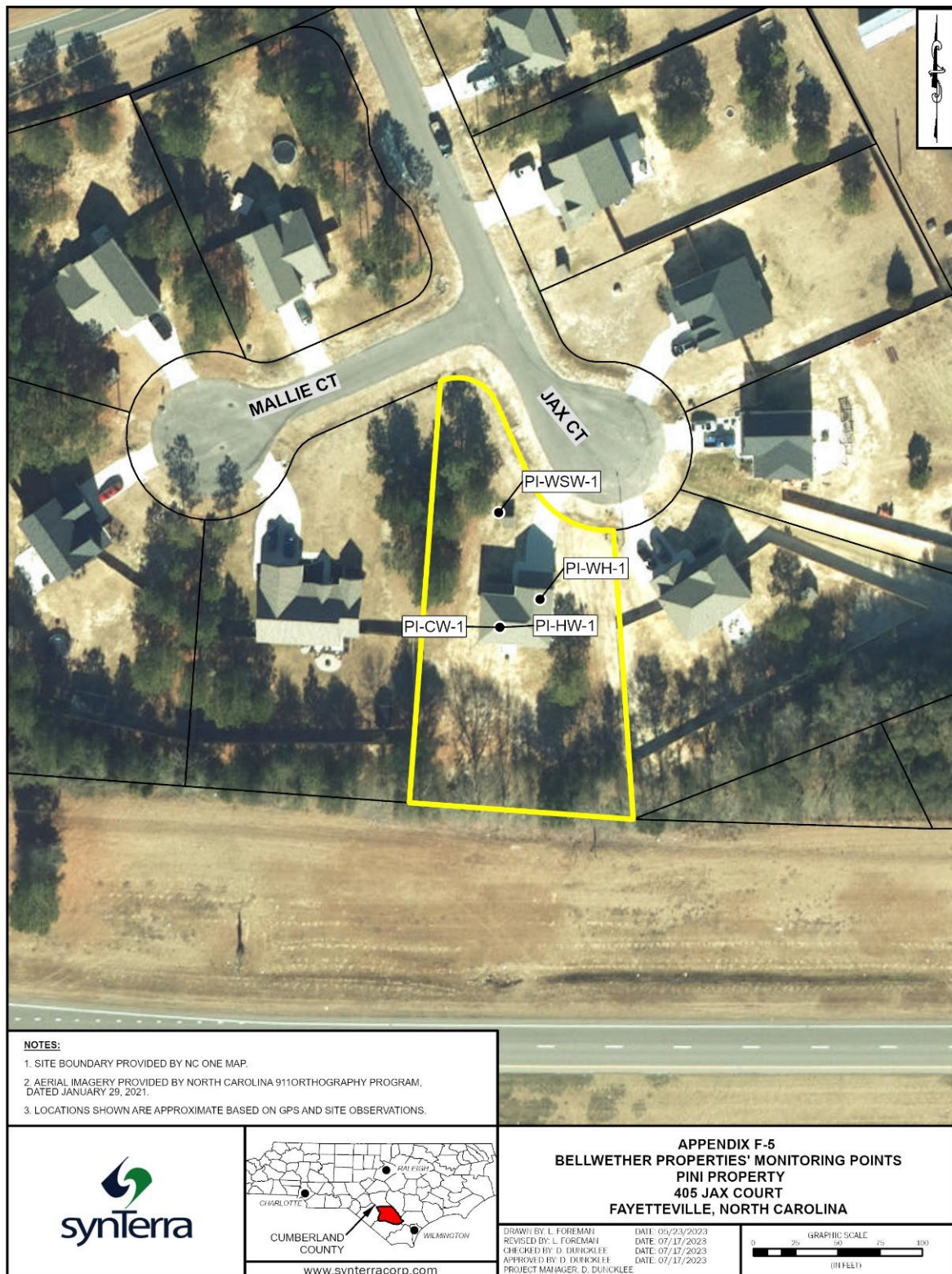
















**Appendix G**  
**Historical Data Tables**

**WATER SUPPLY WELL TESTING AT BELLWETHER  
AND SESSOMS PROPERTIES**

***(RELIANCE MATERIALS FOR DATA USED IN APPENDIX G TABLES  
TO BE PRODUCED TO DEFENDANTS ALONG WITH REPORT)***

APPENDIX G-1						
HISTORIC GROUNDWATER MONITORING DATA						
4216 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306						
CONFIDENTIAL CLIENT - 00.2158.03						
ABRIL PROPERTY						
Sample ID			FAY-D-4216Marshwood LakeDr-090617	443767018	Q	WSW-11 <sup>1</sup> Q
Source			Chemours	NC DEQ	Draper Aden	
Sample Date			9/6/2017	2/13/2018	3/17/2022	
Units			(µg/L)	(ng/L)	(ng/L)	
Acronym	Per-and Polyfluoroalkyl Substances (PFAS)	CAS-#				
HFPO-DA	Hexafluoropropylene oxide dimer acid , 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (GenX)	13252-13-6	0.30	284	440	E
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2			260	
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1			190	
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5			80	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9			840	E
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3			0.37	U*-
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9			0.41	J
MMF	Difluoromalonic acid	1514-85-8				
MTP	Perfluoro-2-methoxypropanoic	93449-21-9				
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8			5.8	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7			0.27	U
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6			0.58	U
PFESA BP1	Nafion Byproduct 1	29311-67-9				
PFESA BP2	Nafion Byproduct 2	66796-30-3				
PFMOBA	Perfluoro-4-methoxybutanic acid	749836-20-2				
PFMOPrA/ PFMPA	Perfluoro-3-methoxypropanoic acid	863090-89-5				
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	337-73-1				
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-89-2			5.1	
PFO5DA	Perfluoro (3,5,7,9,11-pentaoxadodecanoic) acid	39492-90-5			0.37	U*-
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6			0.93	U
PPF Acid	Perfluoropropionic acid	422-64-0				
R-EVE	R-EVE	2416366-22-6			26	
Notes:				Created By: TCM	Checked By: RBP	
Bold: Concentration above the Minimum Detection Limit (MDL)						
: Not Reported or Not Analyzed						
Q: Data Qualifer						
J: The analyte has a concentration below the minimum calibration level						
J3: Estimated - sample matrix interference determination not accurate						
P5: Sample dilution occurred due to either matrix interference or						
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit						
X: Indicates the result is from re-injection/repeat/second-column analy						
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside						
*+ : Laboratory Control Sample / Laboratory Control Duplicate is						
E: Result exceeded calibration range						
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds						
ng/L: nanograms/liter; parts per trillion: ppt						
µg/L: micrograms/liter; parts per billion: ppb						

## Expert Report of David L. Duncklee, P.G.

APPENDIX G-2									
HISTORIC GROUNDWATER MONITORING DATA									
7242 FIRE DEPARTMENT ROAD, HOPE MILLS, NORTH CAROLINA 28348									
CONFIDENTIAL CLIENT - 00.2158.03									
DAVIS PROPERTY									
Sample ID			0199-W1-052919	Q	0199-W1-080719	Q	WSW-18 <sup>1</sup>	Q	
Source			NCDEQ		NCDEQ		Draper Aden Associates, Inc.		
Sample Date			5/29/2019		8/7/2019		3/18/2022		
Units			(ng/L)		(ng/L)		(ng/L)		
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#							
HPFO-DA	Hexafluoropropylene oxide dimer acid, Perfluoro-2-methyl-3-oxahexanoic acid (GenX)	13252-13-6	124		81.1		310		
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2					200		
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5	73.8	X	56.9	X	81		
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	61.3	X	54.0	X	170		
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9					780		
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					0.39	U*	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9					0.94	J	
MMF	Difluoromalonic acid	1514-85-8							
MTP	Perfluoro-2-methoxypropanoic	93449-21-9							
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8					9.3		
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7					7.4		
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6					0.6	U	
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	<4.30	UX	<3.94	UX			
PFESA BP2	Nafion Byproduct 2	749836-20-2	28.3	X	33.5	X			
PFMOBA	Perfluoro-4-methoxybutanic acid	863090-89-5	74.2	X	83.4	X			
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	158	X	155	X			
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	3.31	JX	3.27	JX	4.3		
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<4.30	UX	<3.94	UX	<0.39	U	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6					<0.96	U	
PPF Acid	Perfluoropropionic acid	422-64-0							
R-EVE	R-EVE	2416366-22-6					57		
Notes:					Created By:TCM		Checked By: RBP		
Bold: Concentration above the Minimum Detection Limit (MDL)									
Not Reported or Not Analyzed									
Q: Data Qualifier									
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.									
J3: Estimated - sample matrix interference determination not accurate									
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve									
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit									
X: Indicates the result is from re-injection/repeat/second-column analysis									
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased									
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased									
E: Result exceeded calibration range									
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits									
ng/L: nanograms/liter: ppt									
µg/L: micrograms/liter: ppb									



APPENDIX G-3			
HISTORIC GROUNDWATER MONITORING DATA			
3884 TRANQUILITY ROAD, FAYETTEVILLE, NORTH CAROLINA 28306			
CONFIDENTIAL CLIENT - 00.2158.03			
FAIRCLOTH PROPERTY			
Sample ID			FAY-D-3884TranquilityRD-
Source			The Chemours Company FC, LLC
Sample Date			9/13/2017
Units			(µg/L)
Acronym	Per-and Polyfluoroalkyl Substances (PFAS)	CAS-#	
HFPO-DA	Hexafluoropropylene oxide dimer acid, 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (GenX)	13252-13-6	0.045
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.020
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5	0.0053
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	0.012
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.067
EVE-Acid	Perfluoroethoxypropionic acid	69087-46-3	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	
MMF	Difluoromalononic acid	1514-85-8	
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	
PFESA BP1	Nafion Byproduct 1 (PFESA BP1)	29311-67-9 66796-30-3	
PFESA BP2	Nafion Byproduct 2 (PFESA BP2)	749836-20-2	
PFMOBA	Perfluoro-4-methoxybutanic acid	863090-89-5	
PFMOPrA/ PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2	<0.0020
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.0020
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<0.0020
PPF	Perfluoropropionic acid	422-64-0	
R-EVE	R-EVE	2416366-22-6	
Notes:		Created By: TCM	Checked By: RBP
Bold: Concentration above the Minimum Detection Limit (MDL)			
<div></div> : Not Reported or Not Analyzed			
Q: Data Qualifier			
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.			
J3: Estimated - sample matrix interference determination not accurate			
P5: Sample dilution occurred due to either matrix interference or target analytes being present at concentrations greater than the calibration curve. The reported value was obtained from a result which was bracketed by the calibration curve			
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit			
X: Indicates the result is from re-injection/repeat/second-column analysis			
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased			
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased			
E: Result exceeded calibration range			
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits			
ng/L: nanograms/liter: ppt			
µg/L: micrograms/liter: ppb			

APPENDIX G-4			
HISTORIC GROUNDWATER MONITORING DATA			
405 JAX COURT, FAYETTEVILLE, NORTH CAROLINA 28312			
CONFIDENTIAL CLIENT - 00.2158.03			
PINI PROPERTY			
Sample ID			FAY-D-405JAXCT-W1-1-020421
Source			The Chemours Company FC, LLC
Sample Date			2/4/2021
Units			(µg/L)
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#	
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.0020
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.0020
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5	<b>0.003</b>
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1	<0.0020
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	<b>0.019</b>
EVE-Acid	Perfluoroethoxypropionic acid	69087-46-3	
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	
MMF	Difluoromalonic acid	1514-85-8	
MTP	Perfluoro-2-methoxypropanoic	93449-21-9	
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3	
PFESA BP2	Nafion Byproduct 2	749836-20-2	
PFMOBA	Perfluoro-4-methoxybutanic acid	863090-89-5	
PFMOPrA/P FMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	<0.0020
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.0020
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<0.0020
PPF	Perfluoropropionic acid	422-64-0	
R-EVE	R-EVE	2416366-22-6	
Notes:			Created By:TCM
<b>Bold:</b> Concentration above the Minimum Detection Limit (MDL)			Checked By: RBP
[ ] : Not Reported or Not Analyzed			
Q: Data Qualifier			
J: The analyte has a concentration below the minimum calibration level (Limit of			
J3: Estimated - sample matrix interference determination not accurate			
P5: Sample dilution occurred due to either matrix interference or target analytes being			
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit			
X: Indicates the result is from re-injection/repeat/second-column analysis			
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits,			
high biased			
E: Result exceeded calibration range			
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits			
ng/L: nanograms/liter: ppt			
µg/L: micrograms/liter: ppb			

## Expert Report of David L. Duncklee, P.G.

APPENDIX G-5												
HISTORIC GROUNDWATER MONITORING DATA												
7619 HWY 87 SOUTH, FAYETTEVILLE, NORTH CAROLINA 28306												
CONFIDENTIAL CLIENT - 00.2158.03												
STEVENS PROPERTY												
Sample ID	Well#1 (House, Small Charcoal Pre-Filter)	Well #2 (Historic Trailer/Cam per location)	Well #3 (Barn, Used for Garden)	Well#1 (House, Small Charcoal Pre-Filter)	WSW- 1 <sup>1</sup>	Q	WSW-2 <sup>1</sup>	Q	WSW- 3 <sup>1</sup>	Q		
Source	NCDEQ	NCDEQ	NCDEQ	NCDEQ	Draper Aden Associates, Inc.		Draper Aden Associates, Inc.		Draper Aden Associates, Inc.			
Sample Date	12/4/2017	12/4/2017	12/4/2017	3/14/2018	3/17/2022		3/17/2022		3/17/2022			
Units	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)		(ng/L)		(ng/L)			
Acronym	Per-and Polyfluoroalkyl Substances (PFAS)	CAS-#										
HFPO-DA	Hexafluoropropylene oxide dimer acid, Perfluoro-2-methyl-3-oxahexanoic acid (GenX)	13252-13-6	110	<10	18	163	460	E	19		110	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2					250		14		62	
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5					150		3		16	
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1					530	E	3.1		50	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9					1100	E	94		280	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					0.37	U*	0.36	U*	0.36	U*
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9					6.4		0.22	U	0.36	J
MMF	Difluoromalonic acid	1514-85-8										
MTP	Perfluoro-2-methoxypropanoic	93449-21-9										
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8					10		1.2	U	2.2	J
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7					0.27	U	0.26	U	0.26	U
PFESA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6					0.57	U	0.56		0.56	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3										
PFESA BP2	Nafion Byproduct 2	749836-20-2										
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5										
PFMOPrA/P FMFA	Perfluoro-3-methoxypropanoic acid	337-73-1										
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2					42		0.8	U	3.3	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5					13	*-	0.36	U*	0.57	J*-
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6					0.92	U	0.9	U	0.91	U
PPF	Perfluoropropionic acid	422-64-0										
R-EVE		2416366-22-6					230		0.28	U	7.4	
Notes:												
<b>Bold:</b> Concentration above the Minimum Detection Limit (MDL)												
: Not Reported or Not Analyzed												
Well #1 = WSW-1												
Well #2 = WSW-2												
Well #3 = WSW-3												
Q: Data Qualifier												
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.												
J3: Estimated - sample matrix interference determination not accurate												
PS: Sample dilution occurred due to either matrix interference or target analytes being present at												
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit												
X: Indicates the result is from re-injection/repeat/second-column analysis												
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased												
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased												
E: Result exceeded calibration range												
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits												
ng/L: nanograms/liter: ppt												
ug/L: micrograms/liter: ppb												
Created By: TCM Checked By: RBP												

## Expert Report of David L. Duncklee, P.G.

APPENDIX G-6										
HISTORIC GROUNDWATER MONITORING DATA										
4024 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306										
CONFIDENTIAL CLIENT - 00.2158.03										
SESSOMS PROPERTY										
Sample ID			Not Available	Q	NC State Household ID#1317 - Well Concentration	Q	NC State Household ID#1317 - Tap Concentration	Q	WSW-12	Q
Source			NC DEQ		NC State		NC State			
Sample Date			9/15/2017		2/1/2019		2/1/2019		3/17/2022	
Units			(ng/L)		(ng/L)		(ng/L)		(ng/L)	
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS-#								
HPFO-DA	Hexafluoropropylene oxide dimer acid, Perfluoro-2-methyl-3-oxahexanoic acid (GenX)	13252-13-6	260		187		196		310	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2			108		120		160	
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5			41		50		58	
PFO2HxA	Perfluoro (3,5-dioxahexanoic) acid	39492-88-1			87		93		130	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9			453		529		600	E
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3			<MRL		<MRL		0.35	U*
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9			<MRL		<MRL		0.21	U
MMF	Difluoromalonic acid	1514-85-8			<MRL		<MRL			
MTP	Perfluoro-2-methoxypropanoic	93449-21-9			<MRL		<MRL			
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8			3		3		3.3	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7			<MRL		<MRL		0.26	U
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6			<MRL		<MRL		0.55	U
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3			<2.5		<2.5			
PFESA BP2	Nafion Byproduct 2	749836-20-2			<2.5		<2.5			
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5			<MRL		<MRL			
PFMOPrA/P FMPA	Perfluoro-3-methoxypropanoic acid	337-73-1			<MRL		<MRL			
PFO3OA	Perfluoro (3,5,7-triaxoctanoic) acid	39492-89-2			4		5		5	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5			<2.5		<2.5		0.35	U*
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6			<MRL		<MRL		0.88	U
PPF Acid	Perfluoropropionic acid	422-64-0			<MRL		<MRL			
R-EVE	R-EVE	2416366-22-6			<MRL		<MRL		16	
Notes:										
Bold: Concentration above the Minimum Detection Limit (MDL)										
Not Reported or Not Analyzed										
Q: Data Qualifier										
J: The analyte has a concentration below the minimum calibration level (Limit of Quantification (LOQ) value but greater than the Limit of Detection (LOD)). These values should be considered as having measurements uncertainty higher than values within the calibration range.										
U: The analyte was analyzed for, but not detected above the Practical Quantitation Limit										
*- : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, low biased										
*+ : Laboratory Control Sample / Laboratory Control Duplicate is outside acceptance limits, high biased										
E: Result exceeded calibration range										
*1 : Laboratory Control Sample / Laboratory Control Duplicate exceeds control limits										
<MRL: Results were below the method reporting limit.										
ng/L: nanograms/liter: ppt										
µg/L: micrograms/liter: ppb										

**Appendix H**  
**Soil Sample Data Tables From TRC Data, TRC Maps of Sampling Locations, and**  
**Analytical Report for Five Bellwether Properties**

APPENDIX H-1							
COMPOSITE SOIL SAMPLES							
4216 MARSHWOOD LAKE ROAD, FAYETTEVILLE, NORTH CAROLINA 28306							
CONFIDENTIAL CLIENT - 00.2158.03							
ABRIL PROPERTY							
Sample ID			SS01				
Sample Date			3/9/2023		Q		
Units			µg/Kg				
Sample Depth			6-8 inches				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	0.20	J	H	H3	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.043		H	H3	
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	2.5		H	H3	
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	0.36		H	H3	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.41		H	H3	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.030		H	H3	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.070		H	H3	
MMF	Difluoromalononic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.15		H	H3	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.034		H	H3	
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.042		H	H3	
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9					
PFESA BP1	Nafion Byproduct 1	29311-67-9					
PFESA BP2	Nafion Byproduct 2	66796-30-3					
PFHpA	Perfluoroheptanoic acid	749836-20-2	0.063	J	H	H3	
PFHxDA	Perfluoro-n-hexadecanoic acid	375-85-9	<0.040		H	H3	
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.040		H	H3	
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5					
PFMBA	Perfluoro-4-methoxybutanoic acid		<0.047		H	H3	
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.025		H	H3	
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	0.36		H	H3	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	0.30		H	H3	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	0.66		H	H3	
PFPE-1			<0.037		H	H3	
PPF	Perfluoropropionic acid	422-64-0	1.6		H	H3	
R-EVE	R-EVE	2416366-22-6	0.059	J	H	H3	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	0.055	J	H	H3	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<0.11		H	H3	
Notes:			Created By: RBP		Checked By: TCM		
Bold: Concentration above the Minimum Detection Limit (MDL)							
Samples were collected by TRC							
Samples analyzed by EPA B/L/T PFAS - Branched, Linear, and Total PFAS							
µg/Kg: microgram / kilogram: parts per billion: ppb							
ND: Not Detected							
Q: Data Qualifier							
H: Sample was prepped or analyzed beyond the specified holding time.							
H3: Sample was received and analyzed past holding time.							
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.							



APPENDIX H-2							
COMPOSITE SOIL SAMPLES							
7242 FIRE DEPARTMENT ROAD, HOPE MILLS, NC 28348							
CONFIDENTIAL CLIENT - 00.2158.03							
DAVIS PROPERTY							
Sample ID			SS02				
Sample Date			3/9/2023	Q			
Units			µg/Kg				
Sample Depth			6-8 inches				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.046		H	H3	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.059		H	H3	
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	0.42		H	H3	
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	<0.024		H	H3	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.076	J	H	H3	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9					
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.076		H	H3	
MMF	Difluoromalononic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.16		H	H3	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.036		H	H3	
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.045		H	H3	
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9					
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3					
PFESA BP2	Nafion Byproduct 2	749836-20-2	<0.054		H	H3	
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.043		H	H3	
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.043		H	H3	
PFMOBA	Perfluoro-4-methoxybutanic acid	863090-89-5					
PFMBA	Perfluoro-4-methoxybutanoic acid		<0.051		H	H3	
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.051		H	H3	
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	0.083	J	H	H3	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	0.096	J	H	H3	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	0.19	J	H	H3	
PFPE-1			<0.040		H	H3	
PPF	Perfluoropropionic acid	422-64-0	<0.28		H	H3	
R-EVE	R-EVE	2416366-22-6	<0.050		H	H3	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<0.059		H	H3	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<0.12		H	H3	
Notes:			Created By: RBP		Checked By: TCM		
Bold: Concentration above the Minimum Detection Limit (MDL)							
Samples were collected by TRC							
Samples analyzed by EPA B/L/T PFAS - Branched, Linear, and Total PFAS							
µg/Kg: microgram / kilogram: parts per billion: ppb							
ND: Not Detected							
Q: Data Qualifier							
H: Sample was prepped or analyzed beyond the specified holding time.							
H3: Sample was received and analyzed past holding time.							
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.							

APPENDIX H-3							
COMPOSITE SOIL SAMPLE							
3884 TRANQUILITY ROAD, FAYETTEVILLE, NORTH CAROLINA 28306							
CONFIDENTIAL CLIENT - 00.2158.03							
FAIRCLOTH PROPERTY							
Sample ID			SS04				
Sample Date			3/9/2023	Q			
Units			µg/Kg				
Sample Depth			6-8 inches				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.040		H		H3
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.051		H		H3
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	0.66		H		H3
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	<0.020		H		H3
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.095	J	H		H3
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.028		H		H3
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.065		H		H3
MMF	Difluoromalonic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.14		H		H3
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.031		H		H3
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.039		H		H3
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9					
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3					
PFESA BP2	Nafion Byproduct 2	749836-20-2	0.055	J	H		H3
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.037		H		H3
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.037		H		H3
PFMOBA	Perfluoro-4-methoxybutanic acid	863090-89-5					
PFMBA	Perfluoro-4-methoxybutanoic acid		<0.044		H		H3
PFMOPrA/PFMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.023		H		H3
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	0.16	J	H		H3
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	0.12	J	H		H3
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	0.65	J	H		H3
PFPE-1			<0.034		H		H3
PPF	Perfluoropropionic acid	422-64-0	<0.24		H		H3
R-EVE	R-EVE	2416366-22-6	<0.043		H		H3
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<0.051		H		H3
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<0.10		H		H3
Notes:		Created By: RBP	Checked By: TCM				
Bold: Concentration above the Minimum Detection Limit (MDL)							
Samples were collected by TRC							
Samples analyzed by EPA B/L/T PFAS - Branched, Linear, and Total PFAS							
µg/Kg: microgram / kilogram: parts per billion: ppb							
ND: Not Detected							
Q: Data Qualifier							
H: Sample was prepped or analyzed beyond the specified holding time.							
H3: Sample was received and analyzed past holding time.							
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.							

## Expert Report of David L. Duncklee, P.G.

APPENDIX H-4							
COMPOSITE SOIL SAMPLE							
405 JAX COURT, FAYETTEVILLE, NORTH CAROLINA 28306							
CONFIDENTIAL CLIENT - 00.2158.03							
PINI PROPERTY							
Sample ID					SS05		
Sample Date					3/9/2023	Q	
Units					µg/Kg		
Sample Depth					6-8 inches		
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.046		H	H3	
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.058		H	H3	
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	0.25		H	H3	
PFMOAA	Perfluoro (3,5-dioxaheptanoic) acid	674-13-5	<0.023		H	H3	
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.073	J	H	H3	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.032		H	H3	
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.075	F1	H	H3	
MMF	Difluoromalononic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.16		H	H3	
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.036		H	H3	
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	<0.045		H	H3	
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9					
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3					
PFESA BP2	Nafion Byproduct 2	749836-20-2	<0.054		H	H3	
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.042		H	H3	
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.042		H	H3	
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5					
PFMBA	Perfluoro-4-methoxybutanoic acid		<0.050		H	H3	
PFMOPrA/PMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.027		H	H3	
PFO3OA	Perfluoro (3,5,7-trioxaoctanoic) acid	39492-89-2	0.059	J	H	H3	
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.051		H	H3	
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<0.076		H	H3	
PFPE-1			<0.039		H	H3	
PPF	Perfluoropropionic acid	422-64-0	<0.28		H	H3	
R-EVE	R-EVE	2416366-22-6	<0.049		H	H3	
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<0.058	F1	H	H3	
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<0.11		H	H3	
Notes:		Created By: RBP		Checked By: TCM			
Bold: Concentration above the Minimum Detection Limit (MDL)							
Samples were collected by TRC							
Samples analyzed by EPA B/L/T PFAS - Branched, Linear, and Total PFAS							
µg/Kg: microgram / kilogram: parts per billion: ppb							
ND: Not Detected							
Q: Data Qualifier							
F1: MS and/or MSD recovery exceeds control limits.							
H: Sample was prepped or analyzed beyond the specified holding time.							
H3: Sample was received and analyzed past holding time.							
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.							

APPENDIX H-5							
COMPOSITE SOIL SAMPLE							
7619 NC-87, FAYETTEVILLE, NC 28306							
CONFIDENTIAL CLIENT - 00.2158.03							
STEVENS PROPERTY (GARDEN)							
Sample ID			SS03				
Sample Date			3/9/2023		Q		
Units			µg/Kg				
Sample Depth			6-8 inches				
Acronym	Per- and Polyfluoroalkyl Substances (PFAS)	CAS- #					
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	<0.049			H	H3
PEPA	Perfluoro-2-ethoxypropanoic acid	267239-61-2	<0.62			H	H3
PFO2HxA	Perfluoro-2-methoxyacetic acid	39492-88-1	0.13	J		H	H3
PFMOAA	Perfluoro (3,5-dioxahexanoic) acid	674-13-5	<0.025			H	H3
PMPA	Perfluoro-2-methoxypropanoic acid	13140-29-9	0.049	J		H	H3
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3					
Hydro-EVE Acid	Perfluoroethoxypropanoic Acid	773804-62-9	<0.034			H	H3
Hydrolyzed PSDA	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid	2416366-19-1	<0.080			H	H3
MMF	Difluoromalonic acid	1514-85-8					
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9					
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	<0.17			H	H3
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	<0.038			H	H3
PFECA B	Perfluoro-3,6-dioxahexanoic acid	151772-58-6	<0.048			H	H3
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9					
PFESA BP1	Nafion Byproduct 1	29311-67-9 66796-30-3					
PFESA BP2	Nafion Byproduct 2	749836-20-2	<0.057			H	H3
PFHpA	Perfluoroheptanoic acid	375-85-9	<0.045			H	H3
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.045			H	H3
PFMOBA	Perfluoro-4-methoxybutanoic acid	863090-89-5					
PFMBA	Perfluoro-4-methoxybutanoic acid		<0.053			H	H3
PFMOPrA/P FMPA	Perfluoro-3-methoxypropanoic acid	337-73-1	<0.029			H	H3
PFO3OA	Perfluoro (3,5,7-triaxooctanoic) acid	39492-89-2	<0.048			H	H3
PFO4DA	Perfluoro (3,5,7,9-tetraoxadecanoic) acid	39492-90-5	<0.055			H	H3
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	<0.081			H	H3
PFPE-1			<0.042			H	H3
PPF	Perfluoropropionic acid	422-64-0	<0.30			H	H3
R-EVE	R-EVE	2416366-22-6	<0.052			H	H3
R-PSDA	2,2,3,3,4,5,5,5-octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)-pentanoic acid	2416366-18-0	<0.062			H	H3
R-PSDCA	Ethanesulfonic acid, 1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro1-(trifluoromethyl)propoxy]	241636-21-5	<0.12			H	H3
Notes:		Created By: RBP	Checked By: TCM				
Bold: Concentration above the Minimum Detection Limit (MDL)							
Samples were collected by TRC							
Samples analyzed by EPA B/L/T PFAS - Branched, Linear, and Total PFAS							
µg/Kg: microgram / kilogram: parts per billion: ppb							
ND: Not Detected							
Q: Data Qualifier							
H: Sample was prepped or analyzed beyond the specified holding time.							
H3: Sample was received and analyzed past holding time.							
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.							













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PROJECT:

**7619 NC HWY 87 SOUTH  
FAYETTEVILLE, NORTH CAROLINA**

TITLE:

## SOIL SAMPLING LOCATIONS

## LEGEND



## SOIL BORING LOCATION

NOTE:

1) AERIAL IMAGERY COURTESY OF MrSID  
NCONE MAP, 2021.

0 100 200



SCALE IN FEET

DRAWN BY: K STARK

CHECKED BY: B YUNCU

APPROVED BY: B YUNCU

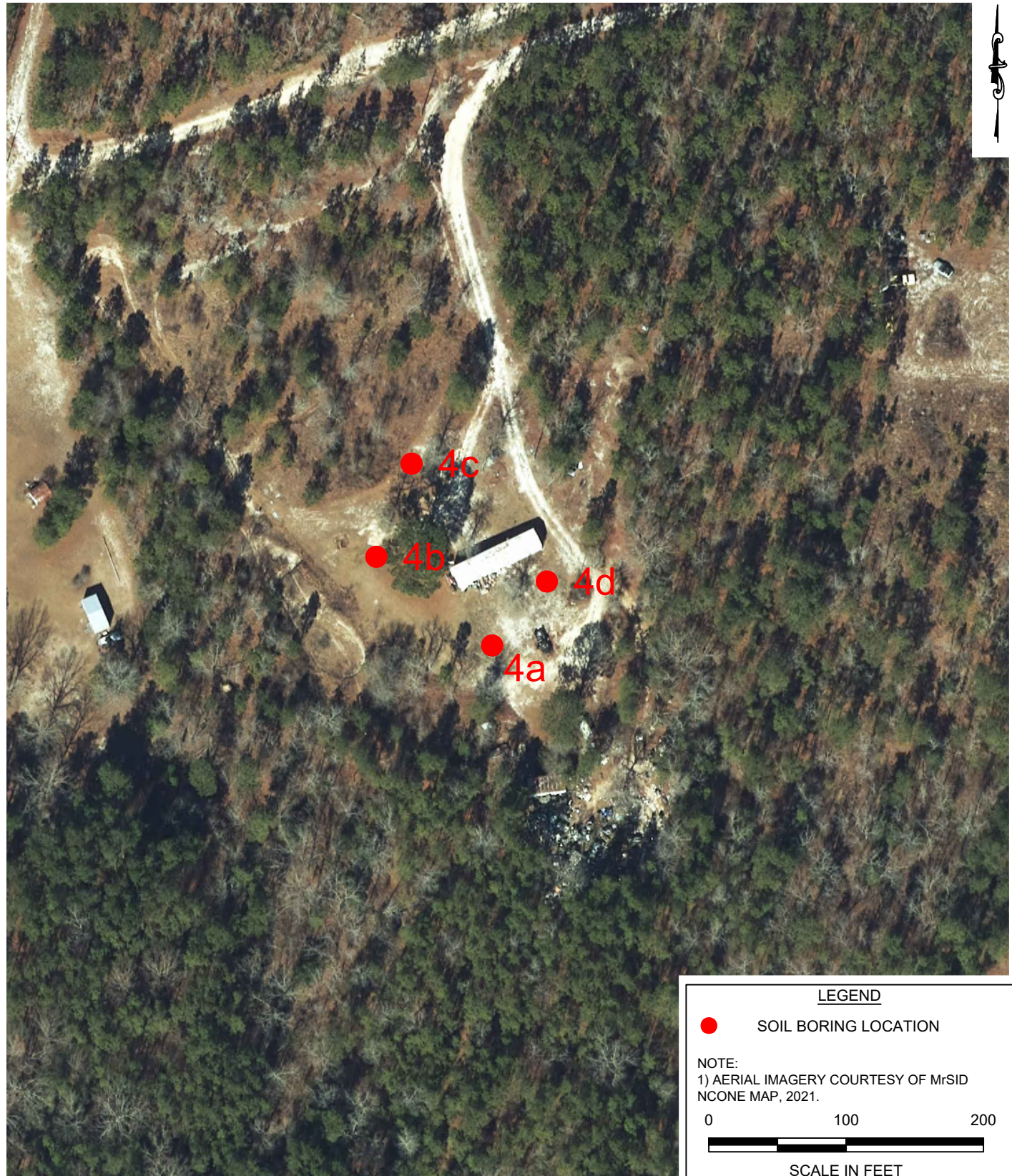
DATE: APRIL 2023

PROJ. NO.:	536972
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FILE: PFAS Fayetteville.dwg

### FIGURE 3





**LEGEND**

● SOIL BORING LOCATION

NOTE:  
1) AERIAL IMAGERY COURTESY OF MrSID  
NCONE MAP, 2021.

0 100 200

SCALE IN FEET



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PROJECT:

**3884 TRANQUILITY ROAD  
FAYETTEVILLE, NORTH CAROLINA**

TITLE:

**SOIL SAMPLING LOCATIONS**

DRAWN BY:

K STARK

CHECKED BY:

B YUNCU

APPROVED BY:

B YUNCU

DATE:

APRIL 2023

PROJ. NO.:

536972

FILE:

PFAS Fayetteville.dwg

**FIGURE 4**

8.5411 - USER: KSWH - ATTACHED XREFS: --- ATTACHED IMAGES: 00560\_37\_000\_20044004\_20210129\_0308R1; 00560\_37\_000\_20044002\_20210129\_0308R0; 00560\_37\_000\_20044004\_20210129\_0308R1; 00560\_37\_000\_20044003\_20210129\_0308R0;  
DRAWING NAME: P:\2022\TRC\536972 - PFAS Soil Sampling Fayetteville\CAD\Current Drawings\ PFAS Fayetteville.dwg --- PLOT DATE: April 05, 2023 - 5:58PM --- LAYOUT: Figure 4

Version: 2017-10-21



